Federal Aviation Administration
Aviation Rulemaking Advisory Committee

General Aviation Certification and Operations Issue Area
IFR Fuel Reserve Working Group

Task 1 – Revise Reserve Requirements

Task Assignment

Aviation Rulemaking Advisory Committee; General Aviation Operations Subcommittee; IFR Fuel Reserve Working Group

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of establishment of IFR Fuel Reserve Working Group.

SUMMARY: Notice is given of the establishment of an IFR Fuel Reserve Working Group by the General Aviation Operation Subcommittee of the Aviation Rulemaking Advisory Committee. This notice informs the public of the activities of the General Aviation Operations Subcommittee of the Aviation Rulemaking Advisory Committee.

FOR FURTHER INFORMATION CONTACT: Mr. Ron Myres, Executive Director, General Aviation Operations Subcommittee, Flight Standards Service (AFS–850), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267–8150; FAX: (202) 267–5230.

SUPPLEMENTARY INFORMATION: The Federal Aviation Administration (FAA) established an Aviation Rulemaking Advisory Committee (56 FR 2190, January 22, 1991) which held its first meeting on May 23, 1991 (56 FR 20492, May 3, 1991). The Genral Aviation Operations Subcommittee was established at that meeting to provide advice and recommendations to the FAA regarding the operation of general aviation aircraft and certification of airmen under parts 61, 91, 125, 133, 137, 141, and 143 of the Federal Aviation Regulations. At its first meeting on May 24, 1991 (56 FR 20492, May 3, 1991), the subcommittee established the IFR Fuel Reserve Working Group.

Specifically, the working group's task is the following:

> Evaluate the advantages and disadvantages of revising the fuel reserve requirements for flight under instrument flight rules; aircraft, avionics and weather forecasts might be more reliable now than in the past. Carrying excess amounts of fuel in addition to the required to reach an alternate may be unnecessary for certain classes of aircraft on special missions or under controlled conditions. Within 90 days of establishment of the subcommittee, the subcommittee should receive a detailed review of the working group's activities, planned future activities, and the timetable for those activities

The IFR Fuel Reserve Working Group will be comprised of experts from those organizations having an interest in the task assigned to it. A working group member need not necessarily be a representative of one of the organizations of the parent General Aviation Operations Subcommittee or of the full Aviation Rulemaking Advisory Committee. An individual who has expertise in the subject matter and wishes to become a member of the working group should write the person listed under the caption **FOR FURTHER INFORMATION CONTACT** expressing that desire and describing his or her interest in the task and the expertise he or she would bring to the working group. The request will be reviewed with the subcommittee chair and working group leader, and the individual advised whether or not the request and can be accommodated.

The Secretary of Transportation has determined that the formation and use of the Aviation Rulemaking Advisory Committee and its subcommittees are necessary in the public interest in connection with the performance of duties imposed on the FAA by law. Meetings of the full committee and any subcommittees will be open to the public except as authorized by section 10(d) of the Federal Advisory Committee Act. Meetings of the IFR Fuel Reserve Working Group will be not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of working group meetings will be made.

Issued in Washington, DC, on October 7, 1991.

Ron Myres,

Executive Director, General Aviation Operations Subcommittee, Aviation Rulemaking Advisory Committee.

[FR Doc. 91–24731 Filed 10–11–91; 8:45 am]

BILLING CODE 4910–13–M

Recommendation Letter

Helicopter
Association
International

1635 Prince Street, Alexandria, Virginia 22314-2818 Telephone: (703) 683-4646 Fax: (703) 683-4745

April 1, 1997

Mr. Louis Cusimano
Manager, General Aviation & Commercial Division
Federal Aviation Administration
AFS-800
800 Independence Avenue, S.W.
Washington, DC 20591

Re: *Request for Economic Analysis and Legal Review of Aviation Rulemaking Advisory Committee Pending Recommendation, "Flight plan requirements for helicopter operations under Instrument Flight Rules"*

Dear Mr. Cusimano:

As Assistant Chair of the Aviation Rulemaking Advisory Committee (ARAC) General Aviation Operations Issues Group, I write to request economic analysis and legal review of a proposed Notice of Proposed Rulemaking (NPRM) soon to be forwarded to the Federal Aviation Administration (FAA) for consideration, "Flight plan requirements for helicopter operations under Instrument Flight Rules," hereinafter "Helicopter IFR." A draft of the Helicopter IFR NPRM is enclosed for your examination.

The General Aviation Operations Issues Group will meet on April 25, 1997, to review to the Helicopter IFR proposal. I expect to forward the proposal to the FAA shortly thereafter.

Please call if you have any questions regarding this request. Many thanks for your assistance.

Sincerely

Glenn Rizner
Assistant Chair,
ARAC General Aviation Operations Issues Group

cc: Ms. Cindy Berman (without enclosure)
Mr. Steven Brown (without enclosure)
Mr. James Church (without enclosure)
Mr. William Wallace (without enclosure)

APR 30 1997

Mr. Glenn Rizner
Aviation Rulemaking Advisory Committee
General Aviation Operations Issues Group
1635 Prince Street
Alexandria, VA 22314-2818

Dear Mr. Rizner:

This is to acknowledge your April 1, 1996, letter in which you submitted the draft Notice of Proposed Rulemaking (NPRM) on "Flight Plan Requirements for Helicopter Operations Under Instrument Flight Rules" and requested the Federal Aviation Administration to conduct legal and economic analysis.

Copies of the draft proposal have been forwarded to the Office of Aviation Policy and Plans and the Office of Chief Counsel with requests that the economic analysis be completed by July 1, 1997, and the legal review be completed by August 1, 1997 (thirty days after completion of the economic analysis).

Thank you for the time and continued support that the aviation community provides through the Aviation Rulemaking Advisory Committee.

Sincerely,

Original Signed By
Joseph A. Hawkins

Joseph A. Hawkins
Director, Office of Rulemaking

Helicopter
Association
International

1635 Prince Street, Alexandria, Virginia 22314-2818 Telephone: (703) 683-4646 Fax: (703) 683-4745

November 18, 1997

Mr. Joseph A. Hawkins
Executive Director
Aviation Rulemaking Advisory Committee
Office of Rulemaking (ARM-1)
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Re: *Flight plan requirements for helicopter operations under Instrument Flight Rules, Proposed NPRM, Draft of October 15, 1997*

Dear Mr. Hawkins:

The Aviation Rulemaking Advisory Committee's General Aviation Operations Issues Group has instructed me to submit the above-referenced document for rulemaking consideration. The Issues Group reached unanimous consensus in support of this proposal.

This proposed draft notice of proposed rulemaking (NPRM) is the culmination of almost six years of work by a working group chaired by Mr. Jim Church of United Technologies Corporation. The successful development of this proposal is largely due to Mr. Church's diligent and tireless work to focus the efforts technical experts and industry representatives on the task of facilitating rotorcraft entry into the Instrument Flight Rules (IFR) system.

The result that we forward to you today will enhance rotorcraft flight safety. As the enclosed draft NPRM notes, "Often, IFR equipped and certified helicopters are safely flown by IFR-rated pilots under visual flight rules in weather that might be characterized as marginal VFR. Although such operations are both safe and legal, in these conditions, the FAA would prefer to make the benefits of IFR operation available to these helicopters, and many helicopter pilots would prefer to have the advantages of IFR operation. . . . This proposal is designed to enhance the safety of helicopter operations over that of VFR operation in marginal weather by facilitating entry of helicopters into the IFR system in a manner commensurate with their operational characteristics."

On behalf of Mr. Church, the members of the working group and the rotorcraft industry, we thank the Federal Aviation Administration (FAA) for this opportunity to cooperate in the rulemaking process, and we urge the FAA to act on this rulemaking proposal as expeditiously as possible.

Sincerely

Glenn Rizner
Assistant Chair, ARAC General Aviation Operations Issues Group
Vice President, Operations, HAI

U.S. Department
of Transportation

**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

DEC 15 1997

Mr. Glenn Rizner
Aviation Rulemaking Advisory Committee
Helicopter Association International
1635 Prince Street
Alexandria, VA 22314

Dear Mr. Rizner:

Thank you for your letter forwarding the Aviation Rulemaking Advisory Committee (ARAC)'s recommendation for proposed amendments to 14 CFR part 91 that would change flight plan requirements for helicopter operations under instrument flight rules.

The recommendation was submitted in a format suitable for processing and, therefore, will be presented to Federal Aviation Administration (FAA) management as quickly as possible. If management agrees with the recommendation, a Notice of Proposed Rulemaking (NPRM) will be published in the Federal Register for public comment.

I would like to thank the aviation community for its commitment to the Aviation Rulemaking Advisory Committee, General Aviation Operations Issues, for its expenditure of resources to develop the NPRM. We in the FAA pledge to process the recommendation expeditiously.

Sincerely,

Margaret Gilligan

Guy S. Gardner
Associate Administrator for
Regulation and Certification

Report of the Fuel Requirements Working Group, Aviation Rulemaking Advisory Committee Air Carrier Operations Issues

Background

The Fuel Requirements Working Group was formed to review the fuel supply requirements for flight operations conducted under FAR Parts 121 and 135. The review was initiated because of numerous accidents and incidents involving low-fuel situations and fuel exhaustion including, a recent fatal accident. The former Air Carrier Operations Subcommittee chartered the working group to accomplish the following:

> Determine fuel supply requirements for international and overseas operations including criteria for minimum fuel, diversion fuel, contingency fuel, and alternate fuel. Determine fuel requirements related to redispatching. Develop regulatory language for revision of Parts 121 and 135 and advisory material for publication as one or more advisory circulars.

Members of the working group and the organizations they represent are listed in Appendix A.

Activities

- Meetings. The first working group meeting was held on July 10, 1991. Since then, a total of 12 meetings have been held approximately every other month. The most recent meeting was adjourned on April 16, 1993. In addition, smaller subgroups were formed to accomplish specific tasks to improve the effectiveness of the working group.

- Accident/Incident Review. The working group conducted a review of fuel-related accident and incident reports to determine if the historical data for Federal Aviation Regulations (FAR) Part 121 and Part 135 operations indicate the need for regulatory revision. The review covered 110 Aviation Safety Reporting System (ASRS) reports filed from 1986 to 1992 and 30 National Transportation Safety Board (NTSB) reports filed from 1965 to 1992.

- Survey. The working group developed and circulated an informal survey to obtain the input of industry representatives on issues related to

fuel supply operation and regulations. The informal survey was distributed to organizations represented by working group members, domestic and overseas operators, aircraft dispatcher groups, pilot groups, manufacturers, and other interested industry organizations.

- Fuel Management Principles. The group formulated fuel management principles for preflight fuel planning and en route fuel management and developed low-fuel procedures for pilots, aircraft dispatchers, and air traffic controllers.

- Advisory Circular. The working group drafted an AC that recommends fuel management principles and procedures to the aviation industry.

- Industry Briefings. Working group members briefed interested groups such as the Air Traffic Procedures Advisory Committee (ATPAC), to solicit and receive feedback on the groups' recommendations.

Scope

Although fuel considerations affect all aircraft, the group focused on FAR Part 121 and 135 operations, in keeping with its charter. However, the working group also reviewed FAR Parts 91, 125, and 129 to ensure that its recommendations were consistent with these parts of the FAR.

Conclusions

1. **Clarifying and documenting definitions, regulations, and responsibilities would provide helpful guidance for handling and resolving low-fuel situations.**

   This conclusion is supported by responses to the informal industry survey, the review of fuel-related accidents and incidents, and the opinions of organizations represented by working group members.

   The proposed draft AC describes fuel requirements, defines terms, presents guidance material for en route fuel management, and establishes procedures for pilots, aircraft dispatchers, and air traffic controllers to resolve low-fuel situations. The proposed AC would address the need, as indicated by survey respondents, for improved communication among pilots, controllers, and aircraft dispatchers during low-fuel situation.

2. **The majority opinion of the working group is that the current FAR Part 121 and Part 135 fuel supply regulations are adequate.**

Initially, all working group members agreed that the existing FAR Part 121 and Part 135 fuel supply regulations were adequate. This conclusion was derived from the review of the fuel-related accidents and incidents, which established that the majority of the problems resulted from improper inflight fuel management decisions, not from poor flight planning or from fuel supply regulations. The conclusion is also supported by the informal industry survey conducted in 1991. However, some working group members now feel that, if a similar survey were circulated after the publication of the AC, it would elicit a different response.

It is noted that the representatives of the major pilot groups recommend that the fuel requirements of FAR Part 121 be increased for specific operations. After initial acceptance of the position that the current rules were adequate, the Allied Pilots Association (APA) and the Air Line Pilots Association (ALPA) completed a more extensive evaluation of all the fuel supply regulations and now propose that the current reserve fuel required by FAR Part 121.645, for international operation of turbine powered airplanes (30 minutes reserve fuel plus 10 percent en route reserve fuel), be revised to be never less than that specified for FAR Part 121.639 (45 minute reserve fuel). Thus, domestic and international flights would both have a minimum reserve of 45 minutes. The pilot groups also note that substantial differences exist among parts of the FAR, and it may be necessary to rewrite the parts, in the future, to ensure consistency.

The other members of the working group respect the viewpoints and expertise of APA and ALPA and feel that their position should be allowed proper consideration and clarification during the industry's review of the proposed AC. Industry responses should be considered when determining whether the current fuel supply regulations should be revised.

Because of the extensive time required to revise regulations, the working group recommends that priority be given to implementing the fuel management policies in the AC. The working group believes that it would be inappropriate to delay the implementation of the AC because the procedures it recommends will increase safety throughout the aviation industry. The working group will make a recommendation to the Aviation Rulemaking Advisory Committee (ARAC) about revising fuel requirements after the AC has been reviewed and released.

3. **Adequate en route fuel management guidance for pilots is lacking.**

   This opinion was voiced by many respondents to the informal industry survey, and the position is consistent with NTSB and ASRS reports on the factors that contribute to accidents and incidents. The proposed AC contains guidance for en route fuel management.

Recommendations

The Fuel Requirements Working Group recommends that the FAA:

1. Issue the enclosed draft AC. The AC contains a description of preflight fuel planning requirements that applies to all FAR parts; fuel management principles for flight operation after departure; and low-fuel procedures for pilots, aircraft dispatchers, and air traffic controllers.

2. Incorporate the fuel planning and management procedures and the definitions of "minimum fuel," "emergency fuel," and "fuel remaining" into all appropriate FAA documents. (Appendix B contains the recommended definitions.) The appropriate documents include but are not limited to the Pilot/Controller Glossary, the Airman's Information Manual, The Controller's Handbook (FAA Order 7110.65), the General Aviation Operations Inspector's Handbook (FAA Order 8700.1), and the Air Transportation Operations Inspector's Handbook (FAA Order 8400.10). Updating these documents will ensure consistent application and presentation of the fuel requirements guidance introduced in the AC.

3. Review the responses received during public comment on the AC and the corresponding recommendations of the working group, when available, to determine whether the fuel supply regulations should be reexamined.

4. Establish a transponder code for the identification of aircraft in a minimum fuel condition.

5. Provide the final AC to the International Civil Aviation Organization (ICAO) and other aviation authorities with the recommendation that the procedures and definitions be incorporated into their governing documents.

6. Disseminate the AC to the widest possible audience of pilots, aircraft dispatchers, and air traffic controllers, including air carriers, Part 129 operators, aviation associations, and organizations.

7. Incorporate the concepts described in the AC into a training video for circulation to all of the parties mentioned in Recommendation 6.

Fuel Requirements Working Group Members

Industry Representatives

Patrick W. Clyne	Northwest Airlines
John H. Enders	Flight Safety Foundation (FSF)
Paul Engel	Allied Pilots Association (APA) (American Airlines)
Steven R. Farrow	Regional Airline Association (RAA) (Henson Aviation Inc.)
Robert W. Hall, Jr.	Air Line Pilots Association (ALPA)
Webster C. Heath	McDonnell Douglas
Norm Joseph	Professional Airline Flight Controllers Association (PAFCA)
Suzanne M. Lubin	International Airline Passengers Association (IAPA)
Al Meyer	Helicopter Association International (HAI) (Era Helicopters)
Donald H. Patterson	Boeing
Albert H. Prest	Air Transport Association of America (ATA)
Brad Rasmussen	Flight Dispatchers, Meteorologists and Operation Specialists Union (World Airways)
George W. Rigert	United Airlines
Richard Thiele	Department of Defense (USAF IFC)
Chris Witkowski	Aviation Consumer Action Project (ACAP)
Richard W. Xifo	National Air Transportation Association (NATA)

Federal Aviation Administration Representatives

David L. Catey	Air Transportation Division
Katherine Hakala	Air Transportation Division
Joseph C. Hart	Air Traffic Procedures Division
William H. Wallace	Air Transportation Division

Fuel Requirements Definitions

MINIMUM FUEL

Current Definition

Minimum Fuel — Indicates that an aircraft's fuel supply has reached a state where, upon reaching the destination, it can accept little or no delay. This is not an emergency situation but merely indicates an emergency situation is possible should any undue delay occur.

Recommended Definition

Minimum Fuel — A minimum fuel condition exists if: (1) The expected fuel on arrival, at the airport of intended landing, based on the flight's expected route to that point of landing, is less than 30 minutes* of flight calculated at 1500 feet above airport elevation, at holding airspeed until fuel exhaustion, with an allowance for established fuel quantity indicating system error; and (2) all available options to resolve a low fuel condition have been exhausted, and no further delay can be accepted.
*(Note: Military aircraft and VFR helicopters may use 20 minutes, as appropriate.)

EMERGENCY FUEL

Current Definition

There is no current definition.

Recommended Definition

Emergency Fuel — An emergency fuel condition exists when the expected fuel on arrival at the airport of intended landing, based on the normal route expected for the flight, is equal to or less than the amount of fuel required to execute a missed

approach, and another approach to landing based on the actual conditions at the airport. This should be no less than the fuel required to climb to 1500 feet, proceed downwind, and then to execute another approach and land from a point 10 miles from the end of the runway. All emergency fuel should include an allowance for established fuel quantity indicating system error.

FUEL REMAINING

Current Definition

Fuel Remaining — A phrase used by either pilots or controllers when relating to the fuel remaining on board until actual fuel exhaustion. When transmitting such information in response to either a controller question or pilot initiated cautionary advisory to air traffic control, pilots will state the approximate number of minutes the flight can continue with the fuel remaining. All reserve fuel should be included in the time stated, as should an allowance for established fuel gauge system error.

Recommended Definition

Fuel Remaining — A term that pilots or air traffic controllers use when referring to the usable fuel remaining on board until actual fuel exhaustion. When transmitting such information, in response to either a controller question or pilot initiated cautionary advisory to air traffic control, pilots should state the approximate number of minutes the flight can continue with the fuel remaining. All reserve fuel should be included in the time stated, as should an allowance for established fuel quantity indicating system error.

U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

OCT 25 1993

DRAFT

Subject: FUEL PLANNING, AND MANAGEMENT Date: Initiated by: AC No: 120-XX Change:

1. PURPOSE. This advisory circular (AC) provides acceptable methods, but not the only methods, of effective fuel planning and management for air carrier flight operations conducted under Federal Aviation Regulations (FAR) Parts 121 and 135. This AC also provides fuel calculation methods and acceptable actions to be taken if a low fuel situation develops during flight operations. The AC emphasizes good planning and judgment as key to safe fuel management.

2. FOCUS. This AC applies primarily to domestic, flag, and supplemental air carrier operations and commercial operations conducted under FAR Part 121 and to on-demand air taxi and commuter operations conducted under FAR Part 135. The fuel management principles discussed in this AC can also be applied to operations conducted under FAR Parts 91, 125, and 129. Specific regulatory fuel requirements for FAR Parts 91, 121, 125, and 135 are included in Appendix 1.

3. RELATED FAR SECTIONS.

a. FAR Part 91.

(1) SFAR 29-4 Limited IFR Operations of Rotorcraft.

(2) FAR § 91.3 Responsibility and authority of the pilot in command.

(3) FAR § 91.103 Preflight action.

(4) FAR § 91.151 Fuel requirements for flight in VFR conditions.

(5) FAR § 91.153 VFR flight plan: Information required.

(6) FAR § 91.167 Fuel requirements for flight in IFR conditions.

FAA Form 1320-15 (4-82) Supersedes WA Form 1320-2

(7) FAR § 91.169 IFR flight plan: Information required.

b. FAR Part 121.

(1) FAR § 121.181 Transport category airplanes: Reciprocating engine powered: En route limitations: One engine inoperative.

(2) FAR § 121.183 Part 25 transport category airplanes with four or more engines: Reciprocating engine powered: En route limitations: Two engines inoperative.

(3) FAR § 121.193 Transport category airplanes: Turbine engine powered: En route limitations: Two engines inoperative.

(4) FAR § 121.329 Supplemental oxygen for sustenance: Turbine engine powered airplanes.

(5) FAR § 121.331 Supplemental oxygen requirements for pressurized cabin airplanes: Reciprocating engine powered airplanes.

(6) FAR § 121.333 Supplemental oxygen for emergency descent and for first aid; turbine engine powered airplanes with pressurized cabins.

(7) FAR § 121.533 Responsibility for operational control: Domestic air carriers.

(8) FAR § 121.535 Responsibility for operational control: Flag air carriers.

(9) FAR § 121.537 Responsibility for operational control: Supplemental air carriers and commercial operators.

(10) FAR § 121.557 Emergencies: Domestic and flag air carriers.

(11) FAR § 121.559 Emergencies: Supplemental air carriers and commercial operators.

(12) FAR § 121.601 Aircraft dispatcher information to pilot in command: Domestic and flag air carriers.

(13) FAR § 121.619 Alternate airport for destination: IFR or over-the-top: Domestic air carriers.

(14) FAR § 121.621 Alternate airport for destination: Flag air carriers.

(15) FAR § 121.623 Alternate airport for destination; IFR or over-the-top: Supplemental air carriers and commercial operators.

(16) FAR § 121.627 Continuing flight in unsafe conditions.

(17) FAR § 121.631 Original dispatch or flight release, redispatch or amendment of dispatch or flight release.

(18) FAR § 121.635 Dispatch to and from refueling or provisional airports: Domestic and flag air carriers.

(19) FAR § 121.639 Fuel supply: All operations: domestic air carriers.

(20) FAR § 121.641 Fuel supply: nonturbine and turbo-propeller-powered airplanes: Flag air carriers.

(21) FAR § 121.643 Fuel supply: Nonturbine and turbo-propeller-powered airplanes; supplemental air carriers and commercial operators.

(22) FAR § 121.645 Fuel supply: Turbine-engine powered airplanes, other than turbo-propeller; flag and supplemental air carriers and commercial operators.

(23) FAR § 121.647 Factors for computing fuel required.

c. FAR Part 125.

(1) FAR § 125.23 Rules applicable to operations subject to this part.

(2) FAR § 125.319 Emergencies.

(3) FAR § 125.367 Alternate airport for destination: IFR or over-the-top.

(4) FAR § 125.375 Fuel supply: Nonturbine and turbopropeller-powered airplanes.

(5) FAR § 125.377 Fuel supply: Turbine-engine-powered airplanes other than turbo-propeller.

d. FAR Part 135.

(1) FAR § 135.19 Emergency operations.

(2) FAR § 135.209 VFR: Fuel supply.

(3) FAR § 135.223. IFR: Alternate airport requirements.

4. RELATED READING MATERIAL.

a. AC 120-42, Extended Range Operation With Two-Engine Airplanes (ETOPS) (12-30-88) (AFS-210).

b. National Transportation Safety Board (NTSB) Aircraft Accident Report PB91-910404.

c. NTSB Accident Report NTISUB/E/104-007.

d. NTSB Accident Report PB-199806.

e. NTSB Accident Report PB85-910408.

f. NTSB Accident Report LAX88LA051.

g. FAA Order 8400.10, Vol. 3, Sections 2, 3, 4, and 5;

h. Air Carrier Operations Specifications

5. BACKGROUND.

a. Avianca Airlines flight 052 departed Bogota, Colombia on January 25, 1990, on an international flight to John F. Kennedy International Airport with an intermediate stop in Medellin, Colombia. At approximately 9:30 p.m. Eastern Standard Time, the Boeing 707-321B crashed in a residential area while attempting its second approach to land. Of the 158 passengers on board, 73 were fatally injured. Although Avianca Airlines flight 052 was conducted under FAR Part 129, an examination of the chain of events leading to the crash provides useful lessons for operations conducted under FAR Parts 91, 121, 125, and 135.

b. Poor weather in the northeast United States had caused air traffic control (ATC) to place Avianca flight 052 in holding patterns three times for a total of approximately 1 hour and 17 minutes. During the third period of holding, the crew reported that the airplane was running out of fuel, could not reach its alternate destination (Boston-Logan International Airport), and could only hold for 5 minutes. After missing the first approach, the aircraft received vectors for a second attempt. While turning inbound to the airport, the aircraft exhausted its fuel supply, lost power to all four engines, and crashed approximately 16 miles from the airport.

c. The National Transportation Safety Board (NTSB) determined that the probable cause of this accident was the flight crew's failure to adequately manage the airplane's fuel load and communicate the emergency fuel situation to air traffic

controllers prior to fuel exhaustion. The NTSB report also cited the following contributing factors:

(1) The flight crew's failure to use an airline operational control dispatch system while conducting an international flight into a congested airport during poor weather.

(2) Lack of standardized terms for use by flight crewmembers and controllers to communicate minimum and emergency fuel conditions.

d. NTSB records for FAR Part 121 and 135 operations indicate that between 1965 and 1989 there have been 30 air carrier accidents that were the result of fuel exhaustion. These accidents had the following contributing factors in common:

(1) Improper inflight fuel management decisions,

(2) Miscalculated fuel consumption,

(3) Mismanagement of fuel.

e. The Fuel Requirements Working Group under the Aviation Rulemaking Advisory Committee analyzed 110 fuel-related Aviation Safety Reporting System reports from the period 1986 to 1991, and NTSB data from the 30 fuel-related accidents. The group also solicited comments from domestic and foreign air carriers, aircraft dispatcher groups, and pilot groups. An analysis of these responses and the accident data indicates the need for:

(1) An explanation of FAR fuel requirements and terminology,

(2) Clarification of the responsibilities of pilots, aircraft dispatchers, and air traffic controllers,

(3) Additional guidance on fuel management principles,

(4) Acceptable procedures to be followed in low fuel situations.

6. INTRODUCTION TO FUEL MANAGEMENT.

a. Safe flight operations are dependent on thorough preflight planning. This planning should include compliance with regulatory requirements; a comprehensive evaluation of the weather and air traffic conditions; the airport conditions at the departure, destination, and alternate airports; and the mechanical condition of the aircraft. The information gained during planning is used to determine the quantity of fuel necessary for the flight.

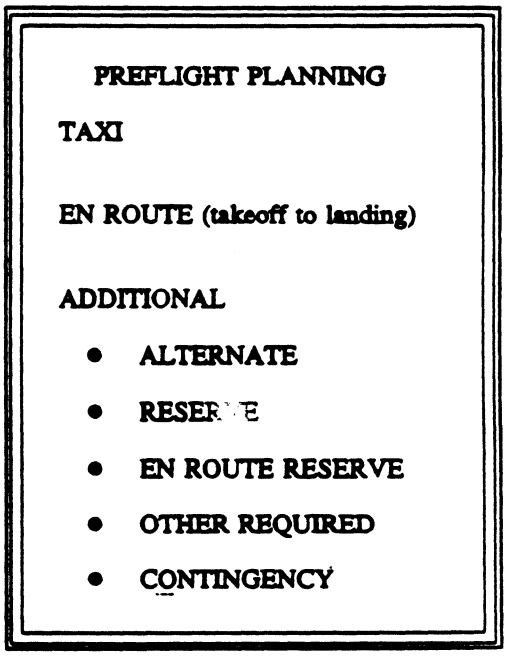
b. Once preflight planning has been completed, the necessary fuel has been loaded, and the flight has departed, it is the responsibility of the pilot and the aircraft dispatcher to monitor the fuel on board as the aircraft proceeds toward its destination and to confirm that sufficient fuel remains to complete the flight safely.

NOTE: All references to aircraft dispatchers are applicable only to FAR Part 121 domestic and flag operations.

c. Even with proper preflight planning and en route fuel management, the flight crew may encounter circumstances (e.g., unanticipated air traffic, airport closings, aircraft routing, and wind and weather conditions) that cause the fuel used to exceed planned quantities. If this occurs, the pilot and/or the aircraft dispatcher should act to prevent the flight from operating in a low fuel condition.

7. FUEL MANAGEMENT - PREFLIGHT PLANNING

a. Preflight fuel planning includes compliance with the regulatory requirements. Federal Aviation Regulations specify the minimum fuel requirements for operations conducted under FAR Parts 91, 121, 125, and 135. FAR Part 121 specifies minimum fuel requirements for domestic, flag, and supplemental air carrier operators and commercial operators. FAR Part 121 further specifies the requirements for engine type and geographic area in which operations are conducted. FAR Part 135 fuel requirements are specified for type of aircraft, day versus night operation, and whether the operation is conducted under Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) conditions. Air Carrier Operation Specifications may further define fuel requirements. A detailed description of regulatory fuel requirements, by operating part, is contained in Appendix 1 of this AC and in the set of charts entitled Summary of FAR Fuel Requirements.



NOTE: Because the FAR is subject to revision, operators using this AC should consult the most current edition of the FAR, to verify that the FAR references are not obsolete.

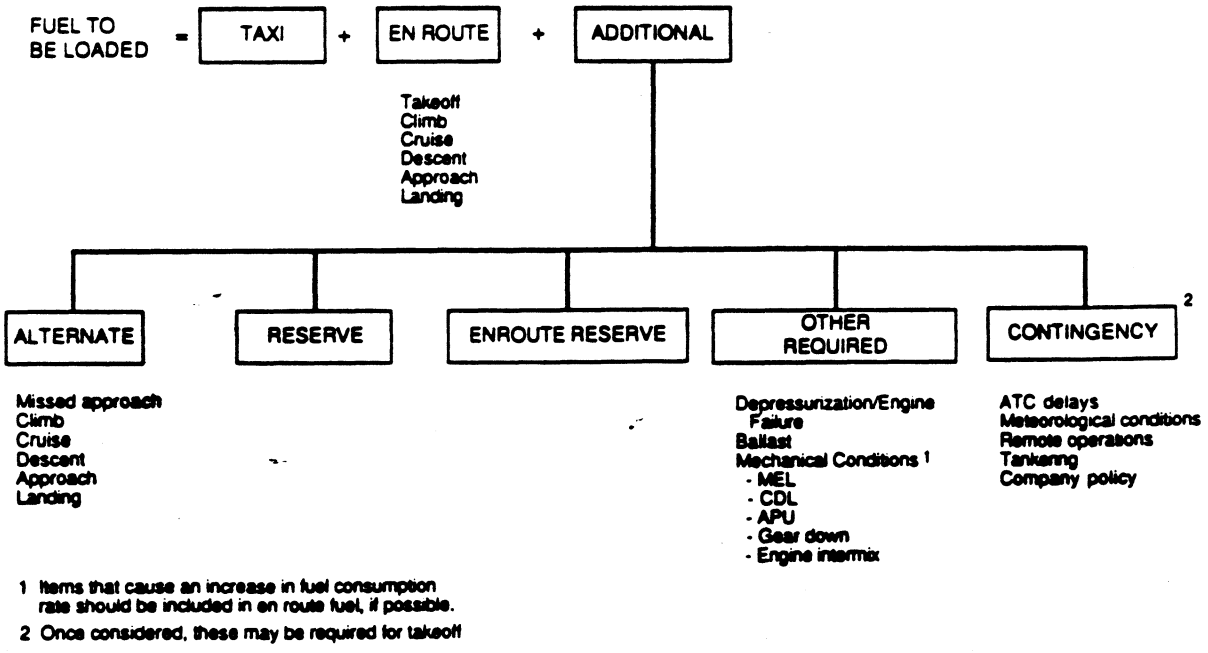
b. Preflight fuel planning should account for the fuel needed to position the aircraft for takeoff, to fly to the destination along the planned route, and additional fuel. This additional amount of fuel includes alternate fuel, reserve fuel, en route reserve, other required fuel, and contingency fuel. It allows continued operation of the aircraft in the event of either anticipated or unanticipated circumstances. The different fuel considerations are illustrated in Figure 1 and are listed below:

NOTE: All required fuel is in addition to unusable fuel.

(1) Taxi Fuel. The fuel necessary to position the aircraft for takeoff. When determining this quantity, consideration should be given to any known or anticipated delays that the aircraft may encounter while taxiing to the runway.

(2) En Route Fuel. The fuel necessary for takeoff, climb, cruise, descent, approach, and landing at the destination. Calculations should include allowances for the expected wind and weather conditions forecast for the flight and aircraft-specific fuel consumption rates. This quantity should allow for any known or expected air traffic routings, standard instrument departures, or arrival procedures. Fuel sufficient to conduct an instrument approach at the destination should be included, if appropriate.

FIGURE 1. FUEL PLANNING



1 Items that cause an increase in fuel consumption rate should be included in en route fuel, if possible.

2 Once considered, these may be required for takeoff

(3) Alternate Fuel. The fuel necessary to fly from the destination to an alternate airport(s). An alternate may be specified because of regulatory requirements or other operational considerations. The calculation of the alternate fuel amount begins at the missed approach point at the destination and includes climb, cruise, descent, approach, and landing at the alternate airport. The amount of alternate fuel should be based on normal air traffic routing and procedures, and forecast meteorological conditions. For flights for which an alternate is not specified, the operator should consider the need to provide fuel for a missed approach at the destination.

(4) Reserve Fuel. The fuel that allows continued operation after arriving over the alternate airport, or the destination if no alternate is specified. The FAR specifies, by type of operation, both the time that an aircraft should be able to remain in flight, and the fuel consumption rate at which the reserve fuel should be calculated. (See Appendix 1 for specific regulatory requirements.) The fuel consumption rate is calculated based on one of the following:

(i) The holding speed at 1500 feet above the alternate or destination airport at standard temperature conditions,

(ii) The normal cruising fuel consumption. Acceptable methods of calculating normal cruising fuel consumption include using the average fuel flow rate, representative of the operator's use of the aircraft type; or using the fuel consumption rate attained at the end of the alternate or en route flight segment, or

(iii) The normal cruising speed. Normal Cruising speed is a specific speed schedule selected by the operator.

(5) En Route Reserve. Additional fuel that is calculated as a percentage of the en route flight time to the airport of intended landing on certain international flights. The purpose of en route reserve is to allow for variations in operational conditions that may result in a higher fuel usage than planned. For example, FAR §§ 121.645(b)(2) and 125.377(b)(2) specify that an additional fuel amount be calculated using 10 percent of the en route flight time. The operator may use any reasonable method, appropriate to the operation, to determine this fuel quantity. An acceptable method of calculation is to use the fuel consumption rate at the end of the en route segment to determine this amount. (En route reserve requirements may be amended by Operations Specifications paragraphs B43 or B44. Redispatch/rerelease procedures that reduce the en route reserve amount are discussed in paragraph 7c. Special fuel reserves for international operations are discussed in paragraph 7d.)

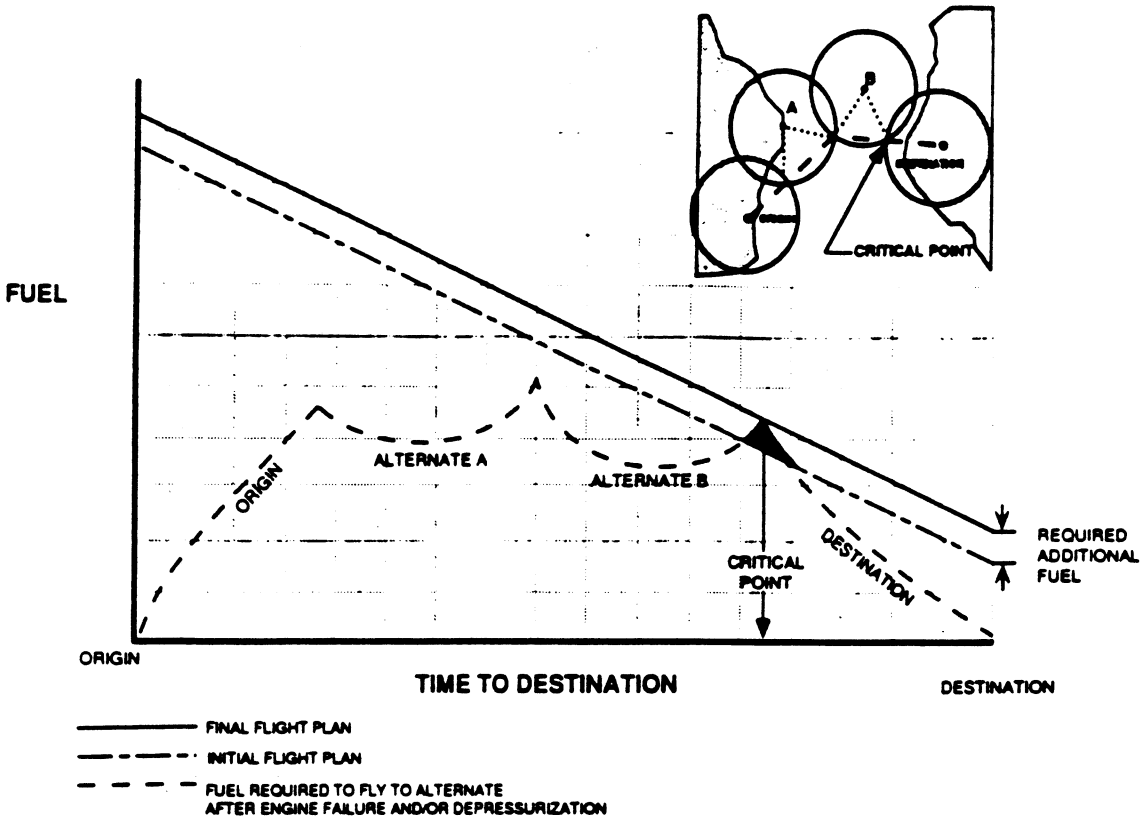
(6) Other Fuel Required for Takeoff. Other types of fuel required for takeoff include the following:

(i) Fuel for Aircraft Mechanical Conditions. Fuel planning should consider other conditions that increase fuel consumption or require that additional fuel be carried. Examples include Minimum Equipment List (MEL) and Configuration Deviation List limitations, fuel for auxiliary power unit operation, engine inter-mix configurations, flights conducted with the landing gear extended and other abnormal operations. Increased fuel consumption should either be included in the en route fuel calculation or specified as Other Fuel Required for Takeoff.

(ii) Fuel for Engine Failure or Depressurization. The FAR prescribes performance operating limitations that affect fuel requirements and should be considered during flight planning. Flight plans should include an allowance for the possibility of the failure of one or more engines and/or the loss of cabin pressurization. An aircraft should have sufficient fuel at the most critical en route point to divert to and land at an airport. During flight planning, it is necessary to compare the fuel necessary to fly to the designated en route alternate at every point along the flight path with the amount of fuel expected to be on board at each point along the route as illustrated in Figure 2. If the fuel expected to be on board at the critical point is not sufficient, additional fuel to complete the diversion should be carried.

(A) Figure 2 illustrates a flight planned from New York's John F. Kennedy Airport to London's Gatwick Airport. An initial flight plan is calculated that includes en route fuel, alternate fuel, and reserve fuel. Gander, Newfoundland (point A in Figure 2) and Keflavik, Iceland (point B in Figure 2) are selected as suitable en route alternate airports. Next, a calculation is performed to determine if at the flight's most critical point the aircraft would have sufficient fuel to reach either of the two planned en route alternates in the event of an engine failure or loss of cabin pressurization. In this example, the initial flight plan diagonal illustrates that at the most critical point between Keflavik and London the aircraft would not have enough fuel to reach either airport. Therefore, a new flight plan that includes the additional fuel necessary to divert and land safely from the most critical point would have to be computed. This added fuel would then be considered required fuel for takeoff and is illustrated by the final flight plan diagonal.

FIGURE 2. CRITICAL FUEL ANALYSIS



NOTE: A detailed description of the requirements for calculation of the fuel for two-engine aircraft that operate more than 60 minutes from a suitable airport is defined in AC 120-42.

(iii) Fuel for Ballast. Fuel carried to comply with aircraft specific weight and balance requirements. This fuel should be considered unusable fuel.

(7) Contingency Fuel. The FAR requires that consideration be given to any other condition that may delay the landing of the aircraft. These conditions include meteorological conditions, air traffic delays, and deviations from the planned flight route that could increase the amount of fuel consumed.

(i) Factors that may influence the decision to add fuel may include equipment limitations, pilot qualifications, carrier operating experience, company policy, and weather. Additional fuel may not be necessary for expected conditions if an alternative course of action that ensures the safe completion of the flight is available. Additional fuel may be considered for operations into airports with single runways, or into areas of the world in which weather information, airport information, communications, or air traffic services may be limited.

(ii) Operators may also plan to carry additional fuel because of the availability or price of fuel, or company operating policies.

c. Redispatch/Rerelease Procedures.

(1) FAR § 121.631(c) permits the planned redispatch (PRD) of flag air carrier flights and the planned rerelease (PRR) of supplemental air carrier flights. This procedure reduces the en route reserve fuel requirement. These operations are conducted in accordance with Paragraph B44 of the Air Carrier Operation Specifications. Using PRD/PRR, two destinations are identified: 1) the intended destination, and 2) an intermediate destination. The flight is planned and released to the intermediate destination, with the expectation that the flight will be rereleased or redispatched to the intended destination while en route. Prior to reaching the predetermined PRD/PRR point, the pilot and aircraft dispatcher review the en route and destination weather and recalculate the time and fuel required to reach the intended destination. The en route reserve fuel amount required at the PRD/PRR point is based on the en route time from the PRD/PRR point to the destination. When this procedure is used, the requirements applied to an original release, with the exception of the MEL, are met at the time of redispatch or rerelease.

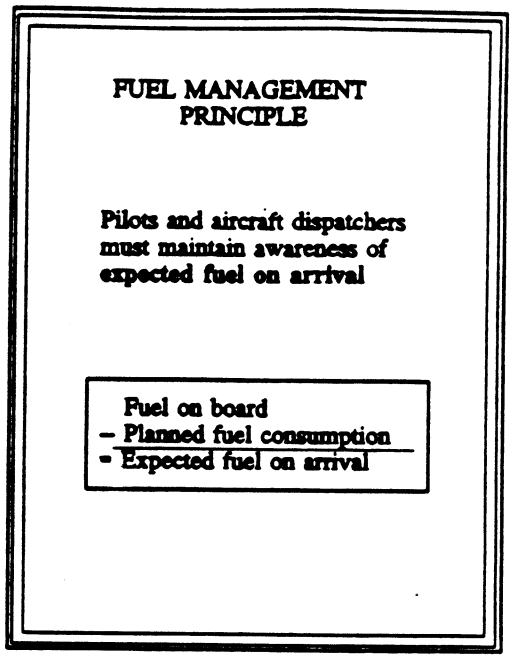
(2) If the fuel on board permits, the flight may be redispatched or rereleased to the intended destination no more than 120 minutes prior to reaching the PRD/PRR point.

d. Special Fuel Reserves in International Operations. Fuel supplies required by B43 of the Air Carrier Operation Specifications are essentially the same as those required for domestic operations. Operations conducted in accordance with B43 require that additional international fuel supplies be loaded on board the airplane when a portion of the route requires use of a long-range navigation system or flight navigator, i.e. the aircraft position cannot be reliably fixed by ICAO standard NAVAIDs. The additional fuel must be equal to the amount of fuel required to fly for a period of 10 percent of the time it takes to fly that portion of the route where a long-range navigation system or flight navigator is required.

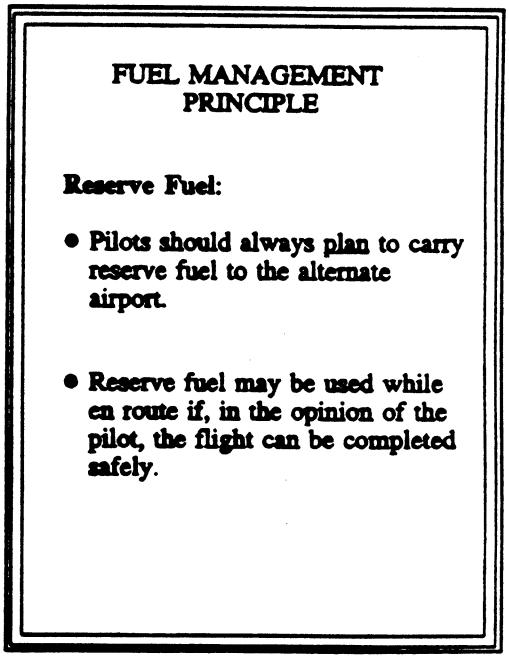
8. FUEL MANAGEMENT - EN ROUTE OPERATION.

a. En route fuel management begins when the pilot verifies that all necessary fuel is boarded. Fuel management continues when, prior to beginning the takeoff roll, the pilot verifies that the fuel on board meets or exceeds the amount required to fly to the destination, then to the alternate (if specified), plus applicable reserve amounts and any additional fuel agreed to by the pilot and aircraft dispatcher.

b. Proper fuel management depends on constant awareness of the expected fuel on arrival (EFOA) at the airport of intended landing. The EFOA is equal to the total fuel on board minus the planned fuel consumption from the aircraft's current position to the airport of intended landing. The pilot and aircraft dispatcher should monitor the EFOA during the flight. Whenever the actual conditions of the flight differ from those anticipated when the flight was planned, the pilot and the aircraft dispatcher should recalculate the EFOA and verify that the flight will arrive at the airport of intended landing with reserve and alternate fuel intact.



c. All flights should be *planned* to land with reserve fuel intact. The purpose of reserve fuel is to allow continued operation if unanticipated delays or circumstances are encountered. This fuel provides an additional margin of safety that is designed to prevent fuel exhaustion. Pilots should be prepared to make fuel management decisions regarding when, and under what circumstances, reserve fuel can be used. Reserve fuel should only be used to complete the flight after all other alternative actions have been taken. Use of reserve fuel is at the pilot's discretion, provided that the flight can be completed safely. Use of reserve fuel does not, in itself, make completion of the flight unsafe.



d. If it becomes apparent that the flight cannot be completed as currently planned, the pilot and the aircraft dispatcher should initiate an alternative course of action. The decision to execute a new plan of action should be made no later than when the EFOA at the airport of intended landing is equal to reserve plus alternate fuel (if applicable). The following options are available:

(1) Change the planned route of flight, the flight level, or the cruise speed to reduce the fuel consumed en route to the airport of intended landing.

(2) Select a different alternate airport that requires less fuel to reach than the one originally specified.

(3) Delete the alternate if no longer required.

(4) Change the airport of intended landing if none of the above alternatives is feasible.

FUEL MANAGEMENT PRINCIPLE

Recalculate EFOA

- Periodically during flight
- When plan is altered
  - Altitude
  - Routing
  - Weather
  - Delays
  - Mechanical condition

e. In order to avoid operating in a low fuel condition, it is imperative that the pilot and aircraft dispatcher make decisions in a timely manner concerning alternative courses of action. It is important to maintain communication between the pilot and the aircraft dispatcher.

9. LOW FUEL CONSIDERATIONS. Proper flight planning and appropriate fuel management procedures should ensure that all flights arrive at the airport of intended landing with reserve fuel remaining. When no alternatives remain that can reduce the fuel required to reach the airport of intended landing, subsequent events may cause the EFOA to decrease to unacceptable levels. This section describes the fuel management procedures that pilots, aircraft dispatchers, and air traffic controllers should follow when a low fuel condition develops. Procedures for low fuel operation assume that the aircraft is flying to the closest suitable airport, and that no alternative airports or procedures are available to the pilot. These procedures also assume that the EFOA is based on the normal routing to be flown.

NOTE: See Appendix 2 - Fuel Management–Low Fuel diagram

a. Minimum Fuel Condition.

(1) A minimum fuel condition exists if:

(i) EFOA at the airport of intended landing, based on the flight's expected route to that point of landing, is less than 30 minutes* of flight, calculated at 1500 feet above airport elevation, at holding airspeed, until fuel exhaustion, with an allowance for established fuel quantity indicating system error; and

(ii) All available options to resolve a low fuel condition (see paragraph 8d, (1)-(4)) have been exhausted, and no further delay can be accepted.

* NOTE: Military aircraft and VFR helicopters may use 20 minutes, as appropriate.

(2) A minimum fuel condition requires that the aircraft proceed to the airport with no further delays or deviations from its planned route of flight. The planned route includes normal arrival procedures plus any delays in routing known at the time the minimum fuel condition is declared to ATC. At this point, priority handling is not required or requested, but air traffic controllers are expected to advise the pilot of any unusual circumstances or occurrences that may further extend the aircraft's flight time to the airport of intended landing, holding, additional delay vectors for weather, spacing for traffic, or speed restrictions. Air traffic controllers should be aware that a declaration of "emergency fuel" may be forthcoming if the pilot encounters any further delays.

LOW FUEL CONDITIONS

Minimum Fuel

A minimum fuel condition exists when the EFOA *IS LESS THAN* 30 minutes of flying time to fuel exhaustion:

- **Calculated at 1500 feet AGL and holding air speed**
- **Plus an allowance for fuel quantity indicating system error**

In all cases, the Minimum Fuel declaration should be made in sufficient time to prevent the development of an emergency fuel condition.

(3) When a minimum fuel condition develops, the pilot should:

(i) Declare "MINIMUM FUEL" to ATC,

(ii) State the usable fuel remaining in minutes,

(iii) Continue along ATC cleared routing. ATC may continue to assign normal arrival routings,

(iv) Notify the aircraft dispatcher that a minimum fuel declaration has been made,

(v) Report present position and time to destination (VFR or nonradar environment operations).

NOTE: "Fuel remaining" is a term that pilots or air traffic controllers use when referring to the usable fuel remaining on board until actual fuel exhaustion. When transmitting such information, in response to either a controller question or pilot initiated cautionary advisory to air traffic control, pilots should state the approximate number of minutes the flight can continue with the fuel remaining. All reserve

fuel should be included in the time stated, as should an allowance for established fuel quantity indicating system error (see the Pilot/Controller Glossary).

(4) When a minimum fuel condition exists, the aircraft dispatcher should contact the appropriate ATC facility to ensure that communication and coordination among the pilot, aircraft dispatcher, and ATC continues until the flight has landed safely.

(5) When a minimum fuel condition exists the air traffic controller should:

(i) Relay this information to the facility to whom control jurisdiction is transferred,

(ii) Be alert for any occurrence that might delay the aircraft,

(iii) Advise the pilot of any unusual circumstances or occurrences that may further extend the aircraft's flight time to the airport of intended landing,

(iv) Be aware that a declaration of "emergency fuel" may be forthcoming if the pilot encounters any further delays.

(6) The following example illustrates a situation in which a minimum fuel declaration is made. All other options (see paragraph 8d, (1)-(4)) have been exhausted prior to making the declaration:

(i) The pilot of Airworthy Flight 123, on an IFR flight plan, determines that the flight time to XYZ is 19 minutes and that the EFOA will be equivalent to 29 minutes. The radio transmission used is "Zulu Approach, Airworthy 123 declaring minimum fuel. I have four eight minutes fuel remaining."

(7) The minimum fuel value used in this AC is based on a review of regulatory fuel amounts, and recognizes that some reserve fuel can be used without compromising safety. In some operations it may be appropriate to take action at a higher minimum fuel value. Early communication of a low fuel state may help to prevent a minimum fuel declaration. The minimum fuel declaration should be made in sufficient time to prevent the development of an emergency condition.

b. Emergency Fuel Condition.

(1) If the EFOA continues to decrease, an emergency fuel condition may develop. An emergency fuel condition exists when the EFOA at the airport of intended landing, based on the normal route expected for the flight, is equal to or less than

the amount of fuel required to execute a missed approach, and another approach to landing based on the actual conditions at the airport. This should be no less than the fuel required to climb to 1500 feet, proceed downwind, and then execute another approach and land from a point 10 miles from the end of the runway. All emergency fuel should include an allowance for established fuel quantity indicating system error.

LOW FUEL CONDITIONS

Emergency Fuel

An emergency fuel condition exists when the EFOA *IS LESS THAN* the amount of fuel required to:

- Execute a missed approach
- Climb to 1500 feet
- Proceed downwind
- Execute a 10-mile final approach to landing
- Plus an allowance for fuel quantity indicating system error.

(2) When an emergency fuel condition exists, the pilot should:

(i) Declare an emergency to ATC,

(ii) State the usable fuel remaining in minutes,

(iii) Ask for and receive priority handling from ATC,

(iv) Proceed directly to the airport,

(v) Advise the aircraft dispatcher of the emergency condition, if time permits.

(3) When an emergency fuel condition exists, the aircraft dispatcher should:

(i) Provide any assistance requested by the pilot.

(ii) Ensure that ALL appropriate ATC facilities are advised of the emergency.

(iii) Ensure that the airport of intended landing is advised of the emergency.

(iv) Ensure that all appropriate emergency procedures and notifications are initiated.

(v) Record the emergency and related circumstances.

(4) When an emergency fuel condition exists the air traffic controller should:

(i) Provide priority handling directly to the airport of intended landing,

(ii) Advise the pilot of any circumstances or occurrences that may further extend the aircraft's flight time to the airport of intended landing,

(iii) Relay this information to the facility to which control jurisdiction is transferred.

(5) It is imperative that pilots and aircraft dispatchers be aware of the fuel quantities that constitute minimum fuel and emergency fuel, respectively. To improve awareness, some operators calculate these values for each flight, and provide this information with the flight dispatch documents.

10. FUEL MANAGEMENT EXAMPLE. The following example depicts a situation in which fuel calculations are necessary en route, and illustrates when an alternative plan becomes imperative.

An air carrier flight is operating under FAR Part 121 domestic regulations from Cleveland Hopkins Airport (CLE) to Washington National Airport (DCA). Pittsburgh International Airport (PIT) is specified as the alternate airport for the flight.

Before the flight, the pilot and aircraft dispatcher review all factors that may affect the flight to determine if the flight can be completed safely. During this preflight planning process they calculate the taxi, en route, alternate, and 45 minute reserve fuel amounts, and then add 30 minutes of contingency fuel that can be used to absorb any delays that might be encountered while en route. Before engine start, the pilot determines that all requested fuel has been loaded. After completing preflight duties and taxiing to the departure runway, the pilot confirms that there is sufficient fuel on board to fly to DCA, then to the alternate airport (PIT), and then to fly for an additional 45 minutes after reaching the alternate. The flight is still carrying an additional 30 minutes of contingency fuel.

The flight departs CLE. After climbing to the cruising altitude, the pilot calculates the EFOA and determines that it will be the same as when the flight was planned. While en route, the flight receives a clearance from ATC to hold at Morgantown VOR for 20 minutes. Using this information, the pilot and the aircraft dispatcher, recalculate the EFOA at DCA and determine that after the holding is complete, the flight can proceed to DCA and arrive with 10 minutes of contingency fuel, as well as sufficient fuel to fly to the alternate airport (PIT), and then fly for an additional 45 minutes.

NOTE: It is a good fuel management practice to calculate the EFOA after departure and again after receiving notice of a

delay. This ensures that there will be enough fuel remaining at the completion of the hold to fly to the airport of intended landing without using the alternate or reserve fuel. If there is insufficient fuel on board, the pilot and aircraft dispatcher should consider other available options for the flight.

After holding at Morgantown for 20 minutes, the flight receives clearance to proceed toward its destination. ATC advises the pilot that flights into DCA can expect further delays. The pilot and the aircraft dispatcher review the weather in the Washington area and determine that based on the weather forecast, Dulles International Airport (IAD), is available as an alternate airport. After changing the alternate to an airport that is closer to the intended destination, they recalculate the EFOA at DCA. The flight has sufficient fuel to fly to DCA, hold in the DCA area for 25 minutes, fly to the alternate airport (IAD), and then fly for an additional 45 minutes.

NOTE: It is a good fuel management practice to consider options that improve the EFOA at the destination. In this example, the alternate has been changed to an airport closer to the destination. This reduces the alternate fuel required, which increases the available contingency fuel.

As the flight proceeds to DCA, it experiences additional holding and receives a series of delaying vectors from ATC. The EFOA is again recalculated. In addition to alternate and reserve fuel, five minutes of contingency fuel remains. Approach control advises the flight that the approach to DCA will take the flight on an extended downwind leg and that additional holding is a possibility. The pilot confers with the aircraft dispatcher and they agree that the flight should divert to the alternate airport.

NOTE: It is a good fuel management practice to recalculate EFOA every time the flight encounters a delay or deviates from the flight plan. The pilot and the aircraft dispatcher should also consider changing the flight destination whenever circumstances develop that may cause the flight to consume reserve fuel. In this case the destination has been changed to the alternate airport so that the flight will arrive at IAD with 45 minutes of reserve fuel remaining.

As the flight proceeds toward IAD, ATC informs the pilot that it will be necessary to fly an extended arrival route because many other aircraft are also diverting to that airport. ATC advises the pilot to expect vectors around the airport before entering a 15-mile final approach. The pilot estimates that the time required to fly to IAD, based on the expected route, will be

NOTE: On this approach, an unexpected go-around will cause the flight to consume additional fuel. The pilot knows that the new EFOA will be unacceptably low, so the flight should return to the airport with no delay. The pilot declares an emergency and begins to fly the most direct route to the airport, and lands on the closest suitable runway.

In this example, the pilot has demonstrated proper fuel management on a flight that experienced numerous unexpected delays. After each delay the EFOA was recalculated and evaluated. The pilot and aircraft dispatcher made timely and appropriate decisions to change the alternate airport and destination, to ensure that the flight would arrive at the alternate (IAD) with 45 minutes of reserve fuel remaining. After experiencing additional delays while diverting to the alternate airport, the pilot declared that a minimum fuel condition existed. Finally, after executing the go-around, the pilot declared a fuel emergency and flew the most direct route to a safe landing.

Each of the decisions made by the pilot and the aircraft dispatcher was based on the EFOA that was recalculated every time the flight encountered a delay. The pilot and the aircraft dispatcher made each decision without delay, when the information indicated that the EFOA had decreased to inappropriately low levels. This enabled the pilot to manage the flight with the knowledge that the aircraft would always have sufficient fuel on board to complete the flight safely.

APPENDIX 1. QUICK REFERENCE GUIDE

1. FAR PART 121 DOMESTIC OPERATIONS.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight dispatch or in a section of the flight dispatch called taxi fuel.

b. En route fuel. FAR §§ 121.639(a) and 121.647(a) and (c). The fuel required for the flight to reach the airport to which it is dispatched and execute one instrument approach [and land].

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 121.619(a).) FAR §§ 121.639(b) and 121.647(a) and (c). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight dispatch, execute an approach, and land.

(2) Reserve Fuel. FAR § 121.639(c). The fuel required for the aircraft to continue flight for 45 minutes at normal cruising fuel consumption.

(3) En Route Reserve. Not Applicable. (N/A).

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR § 121.647(d). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

2. FAR PART 121 FLAG OPERATIONS — NONTURBINE AND TURBO-PROP AIRPLANES.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight dispatch or in a section of the flight dispatch called taxi fuel.

b. En Route Fuel. FAR §§ 121.641(a)(1) and 121.647(c). The fuel required for the flight to reach the airport to which it is dispatched and execute one instrument approach and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 121.621(a)(1).) FAR §§ 121.641(a)(2) and 121.647(c). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight dispatch, execute an approach, and land.

(2) Reserve Fuel.

(i) With Available Alternate. FAR § 121.641(a)(3). The fuel required to fly for 30 minutes plus 15 percent of the total time required to fly at normal cruising fuel consumption to the airport of intended landing and the most distant alternate specified on the dispatch release, or to fly for 90 minutes at normal cruising fuel consumption, whichever is less.

(ii) Without Available Alternate. FAR §§ 121.621(a)(2) and 121.641(b). If no alternate is available there must be enough fuel to fly to the airport of intended landing, considering wind and weather, to execute an approach, and then fly for 3 hours at normal cruising fuel consumption.

(3) En Route Reserve. N/A.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR § 121.647(d). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

3. FAR PART 121 FLAG OPERATIONS — TURBINE-POWERED AIRPLANES (OTHER THAN TURBO-PROPELLER) WITHIN THE CONTIGUOUS UNITED STATES AND DISTRICT OF COLUMBIA. In accordance with FAR § 121.645(a), flag operations using turbine-engine-powered (other than turbo-propeller) airplanes operated within the 48 contiguous States and District of Columbia may use the fuel requirements for domestic air carriers found in FAR § 121.639. These are:

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight dispatch or in a section of the flight dispatch called taxi fuel.

b. En Route Fuel. FAR §§ 121.639(a) and 121.647(a) and (c). The fuel required for the flight to reach the airport to which it is dispatched and execute one instrument approach and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 121.621(a)(1).) FAR §§ 121.639(b) and 121.647(a) and (c). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight dispatch, execute an approach, and land.

(2) Reserve Fuel. FAR § 121.639(c). The fuel required for the aircraft to continue flight for 45 minutes at normal cruising fuel consumption.

(3) En Route Reserve Fuel. N/A.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR § 121.647(d). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

4. FAR PART 121 FLAG OPERATIONS — TURBINE-POWERED AIRPLANES (OTHER THAN TURBO-PROPELLER) OUTSIDE THE CONTIGUOUS UNITED STATES AND DISTRICT OF COLUMBIA.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight dispatch or in a section of the flight dispatch called taxi fuel.

b. En Route Fuel. FAR §§ 121.645(b)(1) and 121.647(c). The fuel required for the flight to reach the airport to which it is dispatched and execute one instrument approach and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 121.621(a)(1).) FAR §§ 121.645(b)(3) and 121.647(c). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight dispatch, execute an approach, and land.

(2) Reserve Fuel.

(i) FAR § 121.645(b)(4). The fuel necessary to fly for 30 minutes at holding speed at 1,500 feet above the alternate airport (or the airport of intended landing if no alternate is required by § 121.621(a)(1)) under standard temperature conditions.

(ii) (Without Available Alternate.) FAR §§ 121.621(a)(2) and 121.645(c). If no alternate airport is available, the aircraft must carry enough fuel to fly to its destination and thereafter to fly for at least 2 hours at normal cruising fuel consumption.

(3) En Route Reserve. FAR § 121.645(b)(2). The fuel needed to fly for a period of 10 percent of the total time required to fly from the airport of departure to the airport to which it is dispatched, and land.

(i) Planned redispatch for flag operations.

(A) FAR § 121.631(c) permits the planned redispatch (PRD) of flag air carrier flights. These operations are conducted in accordance with paragraph B44 of the Air Carrier Operation Specifications. Using this procedure, two destinations are identified, the intended destination and a declared intermediate destination. PRD is conducted by dividing the flight into two segments, the segment from the point of origin to the declared intermediate destination via a redispatch point, and the segment from the redispatch point to the airport of intended landing.

(B) The flight crew and aircraft dispatcher review weather, fuel status, and other conditions no more than 120 minutes before reaching the PRD point. If the flight has progressed as planned and no unexpected events have occurred that unfavorably affect fuel usage, then the original fuel load should be sufficient to provide flight fuel plus the required 10 percent en route reserve from the PRD point to the airport of intended landing. After making this determination the flight may be redispatched.

(ii) Special fuel reserves in international operations. Fuel supplies required by B43 of the operations specifications are essentially the same as those required for domestic operations. However, when a portion of the route requires use of a long-range navigation system or flight navigator (aircraft position cannot be reliably fixed by ICAO standard NAVAIDs), additional international fuel supplies must be loaded on board the airplane. The additional fuel must be equal to the amount of fuel required to fly for a period of 10 percent of the time it takes to fly that portion of the route where a long-range navigation system or flight navigator is required.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR § 121.647(d). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

5. FAR PART 121 SUPPLEMENTAL AND COMMERCIAL OPERATORS. OPERATIONS WITHIN THE 48 CONTIGUOUS STATES AND DISTRICT OF COLUMBIA: NON-TURBINE AND TURBOPROPELLER POWERED AIRCRAFT.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight release or in a section of the flight release called taxi fuel.

b. En Route Fuel. FAR §§ 121.643(a)(1) and 121.647(c). The fuel required for the flight to reach the airport to which it is released and execute one instrument approach and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 121.623.) FAR §§ 121.643(a)(2), and 121.647(c). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight release, execute an approach, and land.

(2) Reserve Fuel. FAR § 121.643(a)(3). The amount of fuel required to fly for 45 minutes at normal cruising fuel consumption.

(3) En Route Reserve. N/A.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR § 121.647(d). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

6. FAR PART 121 SUPPLEMENTAL AND COMMERCIAL OPERATIONS OUTSIDE OF THE 48 CONTIGUOUS UNITED STATES AND THE DISTRICT OF COLUMBIA: NON-TURBINE AND TURBO-PROP AIRCRAFT.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight release or in a section of the flight release called taxi fuel.

b. En Route Fuel. FAR § 121.643(a)(1) and (b) and FAR § 121.647(c). The fuel required for the flight to reach the airport to which it is released and execute one instrument approach and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 121.623.) FAR § 121.643(a)(2), and FAR § 121.647(c). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight release, execute an approach, and land.

(2) Reserve Fuel:

(i) FAR § 121.643(b). The fuel required to fly for 30 minutes plus 15 percent of the total time required to fly at normal cruising fuel consumption to the airport of intended landing and the most distant alternate airport, or to fly for 90 minutes at normal cruising fuel consumption, whichever is less.

(ii) (Without Available Alternate.) FAR §§ 121.623(b) and 121.643(c). If there is no available alternate airport, the aircraft must have enough fuel, considering wind and other weather conditions, to fly to the airport of intended landing and then to fly for 3 hours at normal fuel consumption.

(3) En Route Reserve Fuel. N/A.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR § 121.647(d). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

7. FAR PART 121 SUPPLEMENTAL AND COMMERCIAL OPERATORS. OPERATIONS WITHIN THE 48 CONTIGUOUS STATES AND DISTRICT OF COLUMBIA: TURBINE-POWERED AIRCRAFT (OTHER THAN TURBOPROPELLER).

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight release or in a section of the flight release called taxi fuel.

b. En Route Fuel. FAR §§ 121.643(a)(1) and 121.647(c). The fuel required for the flight to reach the airport to which it is released and execute one instrument approach and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 121.623.) FAR §§ 121.643(a)(2) and 121.647(c). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight release, execute an approach, and land.

(2) Reserve Fuel. FAR § 121.643(a)(3). The amount of fuel required to fly for 45 minutes at normal cruising fuel consumption.

(3) En Route Reserve. N/A.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR § 121.647(d). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

8. FAR PART 121 SUPPLEMENTAL AND COMMERCIAL OPERATIONS OUTSIDE OF THE 48 CONTIGUOUS UNITED STATES AND THE DISTRICT OF COLUMBIA: TURBINE-POWERED AIRCRAFT (OTHER THAN TURBO-PROP).

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight release or in a section of the flight release called taxi fuel.

b. En Route Fuel. FAR §§ 121.645(b)(1) and 121.647(c). The fuel required for the flight to reach the airport to which it is released and execute one instrument approach and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 121.623.) FAR §§ 121.645(b)(3) and 121.647(c). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight release, execute an approach, and land.

(2) Reserve Fuel.

(i) FAR § 121.645(b)(4) The fuel necessary to fly for 30 minutes at holding speed at 1,500 feet above the alternate airport (or the airport of intended landing if no alternate is required by § 121.623(b)) under standard temperature conditions.

(ii) (Without Available Alternate) FAR § 121.623(b) and FAR § 121.645(c). If no alternate airport is available, the aircraft must also carry enough fuel to fly to its destination and thereafter to fly for at least 2 hours at normal cruising fuel consumption.

(3) En Route Reserve Fuel. FAR § 121.645(b)(2). The fuel required to fly for a period of 10 percent of the total time required to fly from the airport of departure to the airport to which it is released, and land.

(i) Planned rerelease for supplemental operations.

(A) FAR § 121.631(c) permits the planned rerelease (PRR) of supplemental air carrier flights. These operations are conducted in accordance with paragraph B44 of the Air Carrier Operation Specifications. Using this procedure, two destinations are identified, the intended destination and a declared intermediate destination. PRR is conducted by dividing the flight into two segments, the segment from the point of origin to the declared intermediate destination via a rerelease point, and the segment from the rerelease point to the airport of intended landing.

(B) The flight crew and flight follower review weather, fuel status, and other conditions no more than 120 minutes before reaching the PRR point. If the flight has progressed as planned and no unexpected events have occurred that unfavorably affect fuel usage, then the original fuel load should be sufficient to provide flight fuel plus the required 10 percent en route reserve from the PRR point to the airport of intended landing. After making this determination the flight may be rereleased.

(ii) Special fuel reserves in international operations. Fuel supplies required by B43 of the operations specifications are essentially the same as those required for domestic operations. However, when a portion of the route requires use of a long-range navigation system or flight navigator (aircraft position cannot be reliably fixed by ICAO standard NAVAIDs), additional international fuel supplies must be loaded on board the airplane. The additional fuel must be equal to the amount of fuel required to fly for a period of 10 percent of the time it takes to fly that portion of the route where a long-range navigation system or flight navigator is required.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR § 121.647(d). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

9. FAR PART 125 OPERATIONS WITHIN THE 48 CONTIGUOUS STATES AND DISTRICT OF COLUMBIA: NON-TURBINE AND TURBOPROPELLER POWERED AIRCRAFT.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight release or in a section of the flight release called taxi fuel.

b. En Route Fuel. FAR § 125.375(a)(1). The fuel required for the flight to reach the airport to which it is released and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 125.367.) FAR § 125.375(a)(2). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight release and land.

(2) Reserve Fuel. FAR § 125.375(a)(3). The amount of fuel required to fly for 45 minutes at normal cruising fuel consumption.

(3) En Route Reserve. N/A.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR §§ 125.23(a) and 91.103(a). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

10. FAR PART 125 OPERATIONS OUTSIDE OF THE 48 CONTIGUOUS STATES AND THE DISTRICT OF COLUMBIA: NON-TURBINE AND TURBO-PROP AIRCRAFT.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight release or in a section of the flight release called taxi fuel.

b. En Route Fuel. FAR § 125.375(a)(1) and (b). The fuel required for the flight to reach the airport to which it is released and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 125.367.) FAR § 125.375(a)(2). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight release and land.

(2) Reserve Fuel:

(i) With Alternate. FAR § 125.375(b). The fuel required to fly for 30 minutes plus 15 percent of the total time required to fly at normal cruising fuel consumption to the airport of intended landing and alternate airport(s), or to fly for 90 minutes at normal cruising fuel consumption, whichever is less.

(ii) Without Available Alternate. FAR §§ 125.367(b) and 125.375(c). If there is no available alternate airport, the aircraft must have enough fuel, considering wind and other weather conditions, to fly to the airport of intended landing and then to fly for 3 hours at normal fuel consumption.

(3) En Route Reserve Fuel. N/A.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR §§ 125.23(b) and 91.103(a). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

11. FAR PART 125 OPERATIONS WITHIN THE 48 CONTIGUOUS STATES AND THE DISTRICT OF COLUMBIA: TURBINE-POWERED AIRCRAFT OTHER THAN TURBO-PROP AIRCRAFT.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight release or in a section of the flight release called taxi fuel.

b. En Route Fuel. FAR § 125.377(a)(1). The fuel required for the flight to reach the airport to which it is released and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 125.367.) FAR § 125.377(a)(2). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight release and land.

(2) Reserve Fuel. FAR § 125.377(a)(3). The amount of fuel required to fly for 45 minutes at normal cruising fuel consumption.

(3) En Route Reserve. N/A.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR §§ 125.23(a) and 91.103(a). The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

12. FAR PART 125 OPERATIONS OUTSIDE OF THE 48 CONTIGUOUS STATES AND THE DISTRICT OF COLUMBIA: TURBINE-POWERED AIRCRAFT OTHER THAN TURBO-PROP AIRCRAFT.

a. Taxi Fuel. Start-up, taxi, and predeparture delay fuel should be included in the en route fuel section of a flight release or in a section of the flight release called taxi fuel.

b. En Route Fuel. FAR § 125.377(b)(1). The fuel required for the flight to reach the airport to which it is released and land.

c. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 125.367.) FAR § 125.377(b)(3). The fuel required to execute a missed approach at the airport of intended landing, fly to the most distant alternate airport specified in the flight release and land.

(2) Reserve Fuel.

(i) FAR § 125.377(b)(4). The fuel necessary to fly for 30 minutes at holding speed at 1,500 feet above the alternate airport (or the airport of intended landing if no alternate is required) under standard temperature conditions.

(ii) (Without Available Alternate.) FAR §§ 125.637(b) and 125.377(c). If no alternate airport is available, the aircraft must also carry enough fuel to fly to its destination and thereafter to fly for at least 2 hours at normal cruising fuel consumption.

(3) En Route Reserve Fuel. FAR § 125.377(b)(2). The fuel required to fly for a period of 10 percent of the total time required to fly from the airport of departure to the airport to which it is released, and land.

(4) Other Required Fuel. As necessary.

(5) Contingency Fuel. FAR §§ 125.23(b) and 91.103(a) The fuel that may be necessary to compensate for any other conditions that may delay the landing of the flight.

13. FAR PART 135 AIRPLANE VFR OPERATIONS.

a. Taxi and En Route Fuel. FAR § 135.209(a). No person may begin a flight in an airplane under Visual Flight Rules (VFR) unless, considering wind and forecast weather conditions, it has enough fuel to fly to the first point of intended landing.

b. Additional Fuel:

(1) Alternate Fuel. N/A.

(2) Reserve Fuel:

(i) FAR § 135.209(a)(1). During the day the required reserve fuel is the amount that allows continued operation for 30 minutes.

(ii) FAR § 135.209(a)(2). At night the required reserve fuel is the amount that allows continued operation for 45 minutes.

(3) Other Required Fuel. As necessary.

(4) Contingency Fuel. Although this fuel increment is not specifically referenced in FAR Part 135, FAR §§ 91.103(a) and 91.167(a) require that any known traffic delays or other information that would affect the flight be considered.

14. FAR PART 135 AIRPLANE IFR CONDITIONS.

a. Taxi and En Route Fuel. FAR § 135.223(a)(1). No person may operate an aircraft in Instrument Flight Rules (IFR) conditions unless it carries enough fuel, considering weather reports or forecasts, to complete the flight to the first airport of intended landing.

b. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 135.223(b).) FAR § 135.223(a)(2). The fuel required to fly from the airport of intended landing to the alternate airport.

(2) Reserve Fuel. FAR § 135.223(a)(3). The fuel required to fly for 45 minutes at normal cruising speed.

(3) Other Required Fuel. As necessary.

(4) Contingency Fuel. Although this fuel increment is not specifically referenced in FAR Part 135, FAR §§ 91.103(a) and 91.167(a) require that any known traffic delays or other information that would affect the flight be considered.

15. FAR PART 135 HELICOPTER VFR OPERATIONS.

a. Taxi and En Route Fuel. FAR § 135.209(b). No person may begin a flight in a helicopter under VFR unless, considering wind and forecast weather conditions, it has enough fuel to fly to the first point of intended landing.

b. Additional Fuel:

(1) Alternate Fuel. N/A.

(2) Reserve Fuel. FAR § 135.209(b). During day or night the required reserve fuel is the amount that allows continued operation for 20 minutes.

(3) Other Required Fuel. As necessary.

(4) Contingency Fuel. Although this fuel increment is not specifically referenced in FAR Part 135, FAR §§ 91.103(a) and 91.167(a) require that any known traffic delays or other information that would affect the flight be considered.

16. FAR PART 135 HELICOPTER IFR CONDITIONS.

a. Taxi and En Route Fuel. FAR § 135.223(a)(1). No person may operate an aircraft in IFR conditions unless it carries enough fuel, considering weather reports or forecasts, to complete the flight to the first airport of intended landing.

b. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 135.223(b).) FAR § 135.223(a)(2). The fuel required to fly from the airport of intended landing to the alternate airport.

(2) Reserve Fuel. FAR § 135.223(a)(3). The fuel required to fly for 30 minutes at normal cruising speed.

(3) Other Required Fuel. As necessary.

(4) Contingency Fuel. Although this fuel increment is not specifically referenced in FAR Part 135, FAR §§ 91.103(a) and 91.167(a) require that any known traffic delays or other information that would affect the flight be considered.

17. FAR PART 91 AIRPLANE VFR CONDITIONS.

a. Taxi and En Route Fuel. FAR § 91.151(a). No person may begin a flight in an airplane under VFR conditions unless, considering wind and forecast weather conditions, it has enough fuel to fly to the first point of intended landing.

b. Additional Fuel:

(1) Alternate Fuel. N/A.

(2) Reserve Fuel:

(i) FAR § 91.151(a)(1). During the day the required reserve fuel is the amount that allows continued operation for 30 minutes.

(ii) FAR § 91.151(a)(2). At night the required reserve fuel is the amount that allows continued operation for 45 minutes.

(3) Other Required Fuel. As necessary.

(4) Contingency Fuel. Although this fuel increment is not specifically referenced, FAR §§ 91.103(a) and 91.167(a) require that any known traffic delays or other information that would affect the flight be considered.

18. FAR PART 91 AIRPLANE IFR CONDITIONS.

a. Taxi and En Route Fuel. FAR § 91.167(a)(1). No person may operate an aircraft in IFR conditions unless it carries enough fuel, considering weather reports or forecasts, to complete the flight to the first airport of intended landing.

b. Additional Fuel:

(1) Alternate Fuel. (If required by FAR § 91.167(b).) FAR § 91.167(a)(2). The fuel required to fly from the airport of intended landing to the alternate airport.

(2) Reserve Fuel. FAR § 91.167(a)(3). The fuel required to fly for 45 minutes at normal cruising speed.

(3) Other Required Fuel. As necessary.

(4) Contingency Fuel. Although this fuel increment is not specifically referenced, FAR §§ 91.103(a) and 91.167(a) require that any known traffic delays or other information that would affect the flight be considered.

19. FAR PART 91 HELICOPTER VFR CONDITIONS.

a. Taxi and En Route Fuel. FAR § 91.151(a). No person may begin a flight in a helicopter under VFR unless, considering wind and forecast weather conditions, it has enough fuel to fly to the first point of intended landing.

b. Additional Fuel:

(1) Alternate Fuel. N/A.

(2) Reserve Fuel. FAR § 91.151(b). During day or night the required reserve fuel is the amount that allows continued operation for 20 minutes.

(3) Other Required Fuel. As necessary.

(4) Contingency Fuel. Although this fuel increment is not specifically referenced in FAR §§ 91.103(a) and 91.167(a) require that any known traffic delays or other information that would affect the flight be considered.

20. FAR PART 91 HELICOPTER IFR CONDITIONS.

a. Taxi and En Route Fuel. FAR § 91.167(a)(1). No person may operate an aircraft in IFR conditions unless it carries enough fuel, considering weather reports or forecasts, to complete the flight to the first airport of intended landing.

b. Additional Fuel:

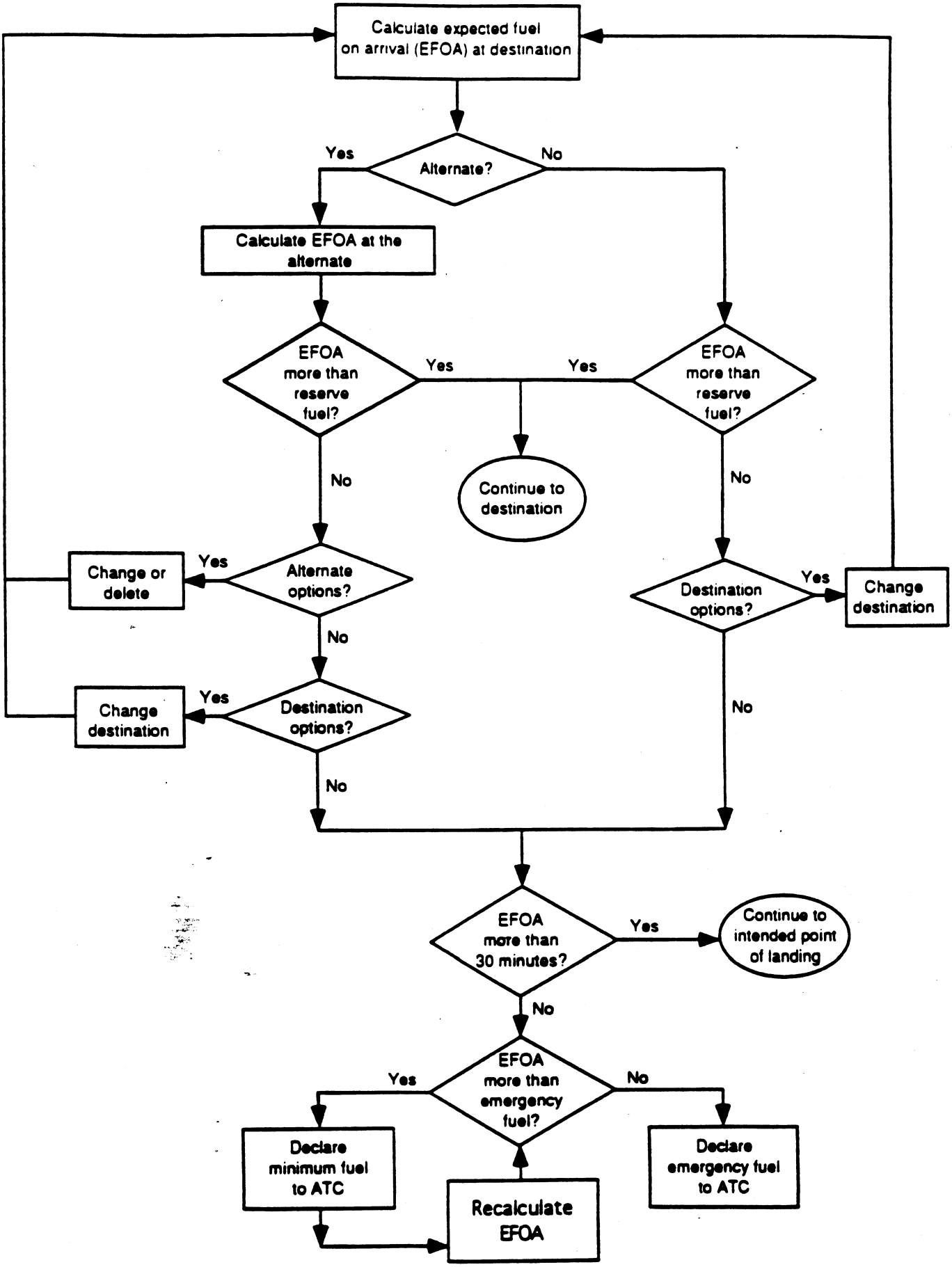
(1) Alternate Fuel. (If required by FAR § 91.167(b).) FAR § 91.167(a)(2). The fuel required to fly from the airport of intended landing to the alternate airport.

(2) Reserve Fuel. FAR § 91.167(a)(3). The fuel required to fly for 30 minutes at normal cruising speed.

(3) Other Required Fuel. As necessary.

(4) Contingency Fuel. Although this fuel increment is not specifically referenced, FAR §§ 91.103(a) and 91.167(a) require that any known traffic delays or other information that would affect the flight be considered.

Appendix 2. Fuel Management & Low Fuel Diagram



Summary of FAR Fuel Requirements

Type of Operation	Fuel Supply Requirement [Reference and Amount]						Comments
	Taxi	En route	Alternate	Reserve	En route Reserve	Other Required and/or Contingency	
• Part 121 • Domestic Operations	Implied in 121.639(a)	121.639(a) 121.647(a) & (c)	121.639(b) 121.647(a) & (c) [See 121.619(a)]	121.639(c) Normal Cruise Consumption for 45 min	None	121.647(d)	
• Part 121 Flag Operations • Non-turbine and Turbo-prop Airplanes	Implied in 121.641(a)(1)	121.641(a)(1) 121.647(c)	121.641(a)(2) 121.647(c) [See 121.621(a)(1)]	121.641(a)(3) Normal Cruise Consumption for the lesser of 30 min + 15% of flight time to destination & alt. or 90 min	None	121.647(d)	
			No available alternate [See 121.621(a)(2)]	121.641(b) Normal Cruise Consumption for 3 hours			
• Part 121 Flag Operations [Use 121.639] • Turbine powered airplanes (other than turbo-propeller) • Within the United States	Implied in 121.639(a)	121.639(a) 121.647(a) & (c)	121.639(b) 121.647(a) & (c) [See 121.621(a)(1)]	121.639(c) Normal Cruise Consumption for 45 min	None	121.647(d)	
• Part 121 Flag Operations • Turbine powered airplanes (other than turbo-propeller) • Outside of the United States	Implied in 121.645(b)(1)	121.645(b)(1) 121.647(c)	121.645(b)(3) 121.647(c) [See 121.621(a)(1)]	121.645(b)(4) 30 min at 1500 feet at holding speed	121.645(b)(2) Normal Cruise Consumption for 10% of flight time to destination	121.647(d)	May be amended by OpSpecs
			No available alternate - see 121.621(a)(2)	121.645(c) Normal Cruise Consumption for 2 hours			

Type of Operation	Fuel Supply Requirement [Reference and Amount]						Comments
	Taxi	En route	Alternate	Reserve	En route Reserve	Other Required and/or Contingency	
• Part 121 Supplemental and Commercial Operations • Non-turbine and Turbo-propeller powered Aircraft • Within the United States	Implied in 121.643(a)(1)	121.643(a)(1) 121.647(c)	121.643(a)(2) 121.647(c) [See 121.623]	121.643(a)(3) Normal Cruise Consumption for 45 min	None	121.647(d)	
• Part 121 Supplemental and Commercial Operations • Non-turbine and Turbo-prop Aircraft • Outside of the United States	Implied in 121.643(a)(1)	121.643(a)(1) & (b) 121.647(c)	121.643(a)(2) 121.647(c) [See 121.623]	121.643(b) Normal Cruise Consumption for the lesser of 30 min + 15% of flight time to destination & alt. or 90 min	None	121.647(d)	
			No available alternate [See 121.623(b)]	121.643(c) Normal Cruise Consumption for 3 hours			
• Part 121 Supplemental and Commercial Operations [Use 121.643] • Turbine powered Aircraft (other than turbo-propeller) • Within the United States	Implied in 121.643(a)(1)	121.643(a)(1) 121.647(c)	121.643(a)(2) 121.647(c) [See 121.623]	121.643(a)(3) Normal Cruise Consumption for 45 min	None	121.647(d)	
• Part 121 Supplemental and Commercial Operations • Turbine powered Aircraft (other than turbo propeller) • Outside of the United States	Implied in 121.645(b)(1)	121.645(b)(1) 121.647(c)	121.645(b)(3) 121.647(c) [See 121.623]	121.645(b)(4) 30 min at 1500 feet at holding speed	121.645(b)(2) Normal Cruise for 10% of flight time to destination	121.647(d)	May be amended by OpSpecs
			No available alternate [See 121.623(b)]	121.645(c) Normal Cruise Consumption for 2 hours	None		

Type of Operation	Fuel Supply Requirement [Reference and Amount]						Comments
	Taxi	En route	Alternate	Reserve	En route Reserve	Other Required and/or Contingency	
• Part 125 Operations • Nonturbine and turbo-propeller powered Aircraft • Within the United States	Implied in 125.375(a)(1)	125.375(a)(1)	125.375(a)(2) [See 125.367]	125.375(a)(3) Normal Cruise Consumption for 45 min	None	125.23(a) 91.103(a)	
• Part 125 Operations • Nonturbine and turbo-prop Aircraft • Outside of the United States	Implied in 125.375(a)(1)	125.375(a)(1) & (b)	125.375(a)(2) [See 125.367]	125.375(b) Normal Cruise Consumption for the lesser of 30 min + 15% of flight time to destination & alt. or 90 min	None	125.23(b) 91.103(a)	
			No available alternate [See 125.367(b)]	125.375(c) Normal Cruise Consumption for 3 hours			
• Part 125 Operations • Turbine powered Aircraft (other than turboprop) • Within the United States	Implied in 125.377(a)(1)	125.377(a)(1)	125.377(a)(2)] [See 125.367]	125.377(a)(3) Normal Cruise Consumption for 45 min	None	125.23(a) 91.103(a)	
• Part 125 Operations • Turbine powered Aircraft (other than turboprop) • Outside of the United States	Implied in 125.377(b)(1)	125.377(b)(1)	125.377(b)(3) [See 125.367]	125.377(b)(4) 30 min at 1500 feet at holding speed	125.377(b)(2) Normal Cruise Consumption for 10% of flight time to destination	125.23(b) 91.103(a)	
			No available alternate [See 125.367(b)]	125.377(c) Normal Cruise Consumption for 2 hours	None		

Type of Operation		Fuel Supply Requirement [Reference and Amount]						Comments
		Taxi	En route	Alternate	Reserve	En route Reserve	Other Required and/or Contingency	
• Part 91 Operations • Airplanes • Visual Flight Rules	VFR DAY	91.151(a)		N/A	91.151(a)(1) Normal Cruising speed for 30 min	None	91.103(a)	
	VFR NIGHT	91.151(a)		N/A	91.151(a)(2) Normal Cruising speed for 45 min	None	91.103(a)	
• Part 91 Operations • Airplanes • Instrument Flight Rules Conditions		91.167(a)(1)		91.167(a)(2) [See 91.167(b)]	91.167(a)(3) Normal Cruising speed for 45 min	None	91.103(a) 91.167(a)	
• Part 91 Operations • Helicopters • Visual Flight Rules Conditions		91.151(a)		N/A	91.151(b) Normal Cruising speed for 20 min	None	91.103(a)	
• Part 91 Operations • Helicopters • Instrument Flight Rules Conditions		91.167(a)(1)		91.167(a)(2) [See 91.167(b)]	91.167(a)(3) Normal Cruising speed for 30 min	None	91.103(a) 91.167(a)	

Type of Operation		Fuel Supply Requirement [Reference and Amount]						Comments
		Taxi	En route	Alternate	Reserve	En route Reserve	Other Required and/or Contingency	
• Part 135 Operations • Airplanes • Visual Flight Rules	VFR DAY	135.209(a)		N/A	135.209(a)(1) Normal Cruise Consumption for 30 min	None	91.103(a)	
	VFR NIGHT	135.209(a)		N/A	135.209(a)(2) Normal Cruise Consumption for 45 min	None	91.103(a)	
• Part 135 Operations • Airplanes • Instrument Flight Rules Conditions		135.223(a)(1)		135.223(a)(2) [See 135.223(b)]	135.223(a)(3) Normal Cruising speed for 45 min	None	91.103(a)	
• Part 135 Operations • Helicopters • Visual Flight Rules	VFR DAY & NIGHT	135.209(b)		N/A	135.209(b) Normal Cruise Consumption for 20 min	None	91.103(a)	
• Part 135 Operations • Helicopters • Instrument Flight Rules Conditions		135.223(a)(1)		135.223(a)(2) [See 135.223(b)]	135.223(a)(3) Normal Cruising speed for 30 min	None	91.103(a)	

[4910-13] October 15, 1997

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR part 91

[Docket No. ; Notice No. 97-]

RIN 2120-

Flight plan requirements for helicopter operations under Instrument Flight Rules

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of Proposed Rulemaking (NPRM).

SUMMARY: The FAA proposes to amend the general operating rules pertaining to flight plan requirements for flight by helicopters under Instrument Flight Rules (IFR) by revising: (1) the destination airport criteria for requiring an alternate airport to be identified on an IFR flight plan, and (2) the weather minimums necessary to designate an airport as an alternate on an IFR flight plan. This proposed rule is needed because current rules discourage helicopter operations under instrument flight rules in marginal weather conditions. This proposed rule would increase safety by allowing helicopter operators access into the IFR system commensurate with the unique flight characteristics of helicopters.

DATE: Comments must be received on or before **[Insert date 120 days after date of publication in the Federal Register]**.

ADDRESS: Send or deliver comments on this notice in triplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-10), Room 915G, Docket No. , 800 Independence Avenue, SW, Washington, DC 20591. Comments may also be submitted to the Rules Docket by using the following Internet address: nprmcmts@mail.hq.faa.gov. Comments must be marked Docket No. . Comments may be examined in the Rules Docket in Room 915G on weekdays between 8:30 a.m. and 5:00 p.m., except on Federal holidays.

FOR FURTHER INFORMATION CONTACT: William H. Wallace, General Aviation Branch (AFS-804) Flight Standards Service, Room ___ Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267-3771.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in this rulemaking by submitting written data, views, or arguments, and by commenting on the possible environmental, economic, and federalism-or energy-related impact of the adoption of this

proposal. Comments concerning the proposed implementation and effective date of the rule are also specifically requested.

Comments should carry the regulatory docket or notice number and should be submitted in triplicate to the Rules Docket address specified above. All comments received and a report summarizing any substantive public contact with FAA personnel on this rulemaking will be filed in the docket. The docket is available for public inspection both before and after the closing date for receiving comments.

Before taking any final action on this proposal, the Administrator will consider the comments made on or before the closing date for comments, and the proposal may be changed in light of the comments received.

The FAA will acknowledge receipt of a comment if the commenter includes a self-addressed, stamped postcard with the comment. The postcard should be marked "Comments to Docket No. _____." When the comment is received by the FAA, the postcard will be dated, time stamped, and returned to the commenter.

Availability of the NPRM

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the Fedworld electronic bulletin board service (telephone: 703-321-3339) or the Federal Register's electronic bulletin board service (telephone: 202-512-1661).

Internet users may reach the FAA's web page at http://www.faa.gov or the Federal Register's webpage at http://www.access.gpo.gov/su_docs for access to recently published rulemaking documents.

Any person may obtain a copy of this NPRM by mail by submitting a request to the Federal Aviation Administration, Office of Rulemaking, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-9677. Communications must identify the notice number of this NPRM.

Persons interested in being placed on the mailing list for future NPRM's should request from the FAA's Office of Rulemaking a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, that describes the application procedure.

Current Helicopter Instrument Flight Rules

14 CFR § 91.169 requires that, unless otherwise authorized by air traffic control (ATC), each person filing an instrument flight rules (IFR) flight plan must include, among other things, an alternate airport designation unless the exceptions in § 91.169(b) are met; these exceptions specify that a person need not designate an alternate airport on an IFR flight plan if 14 CFR part 97 prescribes a standard instrument approach procedure for the first airport of intended landing and, for at least 1 hour before and 1 hour after the estimated time of arrival at that airport, weather reports or forecasts indicate that the ceiling will be 2,000 feet above the airport elevation and the visibility will be at least 3 miles.

In addition, § 91.169(c) states that unless otherwise authorized by the Administrator, no person may include an alternate airport in an IFR flight plan unless current weather forecasts indicate that at the estimated time of arrival at the alternate airport the ceiling and visibility will be at or above the following weather minimums: at airports for which an instrument approach procedure has been published in part 97, the alternate minimums specified in that procedure; or, if none are specified, for precision approach procedures, a

ceiling of 600 feet and visibility of 2 statute miles; for nonprecision approach procedures, a ceiling of 800 feet and visibility of 2 statute miles.

In addition, to operate under IFR, a person operating a civil aircraft must comply with the IFR fuel requirements of § 91.167. Section 91.167 requires that the aircraft must carry enough fuel (considering weather reports and forecasts and weather conditions) to: (1) complete the flight to the intended airport, (2) fly from that airport to an alternate airport, and (3) fly after that for 45 minutes at normal cruising speed or, for helicopters, fly after that for 30 minutes at normal cruising speed.

Section 91.167(b) specifies that the requirement to have sufficient fuel to fly to an alternate airport does not apply if 14 CFR part 97 prescribes a standard instrument approach procedure for the first airport of intended landing and, for at least 1 hour before and 1 hour after the estimated time of arrival at that airport, weather reports or forecasts indicate that the ceiling will be 2,000 feet above the airport elevation and the visibility will be at least 3 miles.

A person who cannot comply with §§ 91.169 and 91.167 may not file an IFR flight plan and may fly only under visual flight rules (VFR).

Helicopter Visual Flight Rules

In contrast to IFR flight minima, VFR flight is permitted in Class C and D airspace, and in Class E airspace below 10,000 feet MSL, as long as the helicopter can remain 500 below clouds, yet at a safe altitude for flight. 14 CFR §§ 91.119(d), 91.155(a) In Class B airspace, and in Class G airspace during daylight, the requirement is merely to remain clear of clouds. 14 CFR § 91.155(a). VFR flight is permitted in Class G airspace when the daytime flight visibility is one statute mile. VFR flight is permitted in Class B, C, and D airspace, and in Class E airspace below 10,000 feet MSL, when flight visibility is three statute miles. 14 CFR § 91.155(a). "Special VFR" allows VFR operation under even lower weather conditions. 14 CFR § 91.157,

As a result, it is legally permissible to operate a helicopter under visual flight rules in weather conditions under which the alternate airport flight plan filing requirements of §§ 91.169 and 91.167 prohibit the helicopter pilot from filing an IFR flight plan, preventing the helicopter from entering the IFR system.

This situation is frequently encountered in fact. Often, IFR equipped and certified helicopters are safely flown by IFR-rated pilots under visual flight rules in weather that

might be characterized as marginal VFR. Although such operations are both safe and legal, in these conditions, the FAA would prefer to make the benefits of IFR operation available to these helicopters, and many helicopter pilots would prefer to have the advantages of IFR operation.

Safety Benefits of IFR Operation

Aircraft operating under IFR are part of the national IFR system, which includes the air traffic monitoring and control structure. This system assures that both pilots and air traffic controllers know where the aircraft is and can work together to avoid hazards and complete the flight safely. In addition, immediate assistance is available in the event of an emergency.

Accident data collected by the National Transportation Safety Board (NTSB) shows that weather related accidents occur far more frequently under VFR than IFR. Between 1986 and 1995, a total of 215 weather related helicopter accidents occurred during flights for which no flight plan had been filed, and an additional 69 accidents occurred during flights for which a VFR flight plan had been filed. The total of 284 VFR accidents resulted in 164 fatalities. During this same period, only 6 weather related accidents occurred during flights for which an IFR plan had been filed.

The NTSB data strongly suggest that helicopter flights conducted under IFR are far less likely to have weather related accidents than helicopter flights conducted under VFR flight plans or those conducted without a flight plan. Some of these accidents and fatalities might have been prevented if the regulations allowed greater flexibility for helicopters to be operated under IFR in marginal weather conditions.

In 1988 the NTSB published a report, "Commercial Emergency Medical Service Helicopter Operations," that was initiated because the accident rate for these operations was twice the rate experienced by part 135 on-demand helicopter operations and one and one-half times the rate for all turbine-powered helicopters. The NTSB determined that marginal weather and inadvertent flight into IMC were the most serious hazards that VFR helicopters encounter. The report states:

> The Board believes that although the IFR system is not designed optimally for IFR helicopters and that the nature of the EMS helicopter mission further complicates this problem, the safety advantages offered by IFR helicopters flown by current and proficient pilots are great enough that EMS programs should seriously consider obtaining this capability.

Anticipated Secondary Benefits

In addition to the safety benefits discussed above, this proposed rulemaking is expected to result in certain

environmental and economic benefits. Environmental benefits result because IFR flights generally are conducted at higher altitudes and therefore create less overflight sound apparent on the ground than VFR helicopter flights in marginal weather conditions. Allowing more operations to be conducted under IFR will reduce helicopter overflight sound on the ground. Similarly, enhancing helicopter access to the IFR system is expected to result in increased utilization of existing IFR-certified and equipped helicopters, thereby yielding economic benefits in terms of greater returns on investment, and more efficient use of equipment, time and other resources. Economic costs and benefits are discussed below under the heading Regulatory Evaluation Summary.

The Unique IFR Flight Capabilities of Helicopters

The current IFR flight plan filing rules were issued to provide safe landing weather minimums in IFR conditions for airplanes operating under IFR. Apart from the distinction in § 91.167 concerning the amount of fuel a helicopter must carry versus the fuel an airplane must carry, flight planning requirements, including alternate airport weather minimums, are the same for airplanes and helicopters even though the operating characteristics of these aircraft are quite different.

Helicopters fly shorter distances at slower speeds than large airplanes, and generally remain in the air for shorter periods between landings. Therefore, a helicopter is less likely to fly into unanticipated, unknown or unforecast weather. The relatively short duration of the typical helicopter flight leg means that the departure weather and the helicopter's destination weather are likely to be within the same weather system.

The short flight time for helicopters also means that at the time of departure the weather forecast for the flight destination at the estimated arrival time (ETA) is likely to be more accurate than a forecast range of one hour before to one hour after ETA. It is not uncommon for a helicopter to take off and land at its destination within a weather station's hourly weather observation. The requirement of §§ 91.169 and 91.167 to consider destination forecasts for the two hour period around an ETA may require the helicopter pilot to consider forecasts that are less accurate than the hourly sequence report for the ETA itself.

FAA IFR Waivers

The FAA has several years of experience with reduced alternate airport weather minimums for helicopter flight planning purposes. During the 1970's, the FAA's New England

Region granted Certificates of Waiver or Authorization which authorized helicopter IFR flight plans using reduced alternate airport weather minimums. These waivers authorized flight plan filing weather minimums of 400 feet (ceiling) and 1 mile (visibility) when § 91.83(c) (predecessor of current § 91.169) provided minimums of 600 feet and 2 miles, and authorized minimums of 500 feet and 1 mile instead of 800 feet and 2 miles.

The FAA's operational experience with these waivers demonstrates that authorizing helicopter operators to file IFR flight plans using reduced alternate airport weather minimums results in a level of safety at least equivalent to that of the current rule, and offers greater operational flexibility for helicopter operators, consistent with the helicopter's inherently flexible operational capability.

History of this Rulemaking

Over the past 15 years, there have been specific recommendations from within the FAA, from industry, and from joint efforts of the agency and industry regarding regulatory changes for the purpose of safely expanding helicopter access to the IFR system. The FAA has been addressing these recommendations by working with industry to identify and,

where possible, grant relief from regulations which prevent safe helicopter operations in the IFR environment.

In 1984 the National Airspace Review (NAR) and in 1985 the Rotorcraft Regulatory Review (RRR) recommended reducing alternate airport minimums. With regard to former § 91.83, predecessor of current § 91.169, NAR Task Group 2-3.1 concluded that,

> current subsection (b) criteria, because of the maneuvering capabilities of helicopters, impose unnecessary restrictions on helicopter operators with regard to ceiling and visibility requirements at primary destination airports, thus necessitating the filing of alternate airports. Furthermore, because of the dearth of alternate airports within the normal flight distance of helicopters, alternate sites are often not available, thus preventing flight plan filing and conducting IFR operations. As a result, lower ceiling and visibility criteria were suggested for rotorcraft in subsection (b)(1) and (2) so as to reduce the frequency of required filing of alternate airports. The criteria ultimately settled upon, however, were those currently in use by the U.S. Army for requiring filing of alternate airports: ceiling 400 feet above the Height Above Airport (HAA) or Height Above Touchdown (HAT) as applicable to the approach (precision or non-precision) to be flown, and at least one-half of the prescribed horizontal visibility for that airport plus one mile (statute) (NAR 2-3.1.4). It was noted during discussions that this standard has been in use by the Army for at least a decade and that no mishaps among its large helicopter fleet have occurred as a direct result of these criteria.
>
> * * *

> The task group considered as well the weather minimums criteria for filing IFR alternate airports (subsection [c]). For the same reasons noted above, lowered ceiling and visibility values for rotorcraft were proposed.

See National Airspace Review, § 91.83, pp. 23-24 (DOT/FAA, August 14, 1984).

In an NPRM issued March 13, 1985, (50 FR 10157), the FAA proposed to amend § 91.23 (now § 91.167) to reduce the fuel reserve requirement for helicopters to 30 minutes from 45 minutes, the ceiling requirement for helicopters from 2,000 feet to 1,000 feet, and the visibility requirement for helicopters from 3 miles to 1 mile. No changes were proposed to § 91.83 (now § 91.169). The FAA stated in the preamble that the basis for the proposed reductions was that the helicopter has the unique ability to reduce airspeed safely on approach to as low as 40 knots, and is therefore provided reduced visibility minimums in part 97. The proposal went on to say that because the helicopter, with its reduced minimums, has a better probability of completing the flight to the planned destination it should be allowed a reduced fuel reserve. The FAA also stated that it had gained sufficient experience with operations under SFAR 29, "Limited IFR Operations of Rotorcraft," to conclude that reducing the

required fuel would not reduce the level of safety. SFAR 29 remains in effect today.

In the final rule of November 7, 1986, (51 FR 40692, 40707) the FAA amended § 91.23 to reduce the fuel reserve but withdrew the proposal to reduce ceiling and visibility minimums because a report, entitled "Weather Deterioration Models Applied to Alternate Airport Criteria," Report No. DOT/FAA/RD-81/92 (September 1981), had stated that "any reduction in alternate airport requirements should be offset by limiting the duration of the flight for which the reduced requirements apply." Id. at p.4-1. However, this was stated as a "preliminary conclusion," because, as the report explained, "The data developed during this study effort are based on the cumulative r^2 model of conditional probabilities. Since the model has not been validated for geographical and seasonal universality the results can only be considered as tentative. Consequently, the conclusions reached at the close of the study have been identified as being preliminary." The report also cautioned that, "Some data are presented for airports in several regions of the country. It should be cautioned that these data were obtained with an unvalidated model and although the results seem very reasonable and consistent, they should be considered only as examples of what

types of data the methodology can produce and not as actual study results." Id. at p.1-2. In the 16 years that have passed since this report was written, FAA's experience with reduced helicopter IFR flight plan filing criteria, developed under SFAR 29 and under the waivers discussed above, indicates that the preliminary concern for reduced helicopter ceiling and visibility minima for IFR flight plan filing purposes was over emphasized.

In August, 1993, a workshop conducted by the FAA with industry, called the Extremely Low Visibility Instrument Rotorcraft Approaches Workshop (ELVIRA), resulted in a list of "Ten Most Wanted" changes. See "Extremely Low Visibility IFR Rotorcraft Approach (ELVIRA) Operational Concept Development, Final Report," Report No. DOT/FAA/RD-94/1,I. (March 1994). The unprioritized list of 10 desired IFR system enhancements includes "Rotorcraft Specific Minima" for determining the need for and availability of alternate airports for flight plan filing purposes. Id. at p.3.

According to the ELVIRA report of December 1993, since rotorcraft are for the most part range limited, their destination airport and alternate airport will most likely be in the same air mass and consequently will have similar weather; current IFR restrictions force helicopter operators

to choose between flying in marginal VFR weather or not flying at all. In its ELVIRA Final report, the FAA noted that the current regulations result in a "severe penalty in the productivity of helicopters operating under IFR." Id. at p.34. The FAA observed that, "with certain weather conditions it is often impossible for the helicopter operator to gain access to the current IFR system, while VFR flight is allowed. . . . [C]hanging this [the alternate airport minimums] to 400-1 for a [helicopter] precision approach and 600-1 for a [helicopter] non-precision approach procedure, will enable many more [helicopter] IFR operations to take place while maintaining the same level of safety." Id. at pp. 34-35.

On February 23, 1995, Helicopter Association International (HAI) petitioned the FAA for an exemption from 14 CFR 91.169(c)(1)(i), which provides that alternate airport minimums for a precision approach are a ceiling of 600 feet and visibility of 2 statute miles. The petition asked the FAA to allow lower alternate airport weather minimums for IFR flight planning.

On April 24, 1996, HAI filed an amendment of its petition for exemption from 14 CFR 91.169(c)(1)(i), proposing, in part, to limit operations under the requested exemption to those

conducted by certain operators named in the amended petition. The stated purpose of this amendment was the further "accumulation of data to prove the operational safety of the use of such minimums." In addition, the FAA has received 13 other petitions requesting amendments to §§ 91.169 and 91.167 to allow helicopter operations with reduced alternate weather requirements.

The FAA's action on this NPRM responds to the purposes stated in HAI's petition and amended petition for exemption, and to the needs stated by other petitioners. With the publication of this NPRM, the FAA is closing the docket on HAI's petition for exemption, and on the petitions submitted by HAI and others for various amendments to 14 CFR §§ 91.169, 91.167 and related regulations.

The ARAC Working Group Recommendation

The Aviation Rulemaking Advisory Committee (ARAC) was established by the FAA to provide industry information and expertise during the rulemaking process. In October, 1991, the FAA assigned to the IFR Fuel Reserve Working Group of the ARAC General Aviation Operations Issues Group the task to "Evaluate the advantages and disadvantages of revising the fuel reserve requirements for flight under instrument flight rules. . . ." 56 FR 51744 (October 15, 1991).

Subsequently, the FAA assigned to the ARAC Helicopter Instrument Approach and Alternate Weather Minimum Working Group, the tasks to: (1) Evaluate the advantages and disadvantages of revised precision and non-precision instrument approach minima and alternate weather minima, considering the operational capability of the helicopter to decelerate before and during arrival at the Decision Height or Minimum Descent Altitude, to include circling approaches, and (2) Evaluate whether or not this capability reduces risk and the probability of a missed approach and the need to proceed to an alternate, and meet the resulting regulatory alternate fuel requirement.

The Helicopter Instrument Approach and Alternate Weather Minimum Working Group consisted of representatives from helicopter associations, helicopter manufacturers, helicopter pilot associations, helicopter operators, and government agencies. The working group met numerous times between January 1992 and October, 1997.

The proposed rule is based on the recommendation of the working group submitted to the FAA in November, 1997.

The Proposed Rule

In response to the needs discussed in this notice, the FAA proposes to amend the general operating rules pertaining

to flight plan requirements for flight by helicopters under Instrument Flight Rules by revising: (1) the destination airport criteria for requiring an alternate airport to be identified on an IFR flight plan, and (2) the weather minimums necessary to designate an airport as an alternate on an IFR flight plan.

The proposal reflects the differences in operational characteristics between airplanes and helicopters by maintaining the current requirements for airplanes while reducing the forecast ceiling and visibility minimums for helicopters. Thus, the proposed rule would revise § 91.169(b) so that an alternate airport designation would not be required on an IFR flight plan for helicopters using standard instrument approach procedures if weather reports or the prevailing weather forecast or a combination of them indicate that at the estimated time of arrival at the intended destination the ceiling will be at least 1,000 feet above the airport elevation or 400 feet above the lowest approach minima, whichever is higher, and the visibility will be at least 2 statute miles.

The proposed rule would also revise § 91.169(c) to reduce alternate airport weather minimums for helicopter flight plan filing purposes as follows: (1) for precision approach

procedures, a ceiling of 400 feet and visibility of 1 statute mile; (2) for non-precision approach procedures, a ceiling of 600 feet and visibility of 1 statute mile; and (3) if no instrument approach procedure has been published in part 97, the ceiling and visibility minimums allowing descent from the MEA, approach, and landing under basic VFR.

Under proposed § 91.167 (b), fuel requirements for an alternate airport would not apply to helicopters if weather reports or the prevailing weather forecast or a combination of them indicate that at the estimated time of arrival at the intended destination, the ceiling will be 1,000 feet above the airport elevation or 400 feet above the lowest approach minima and the visibility will be at least 2 statute miles.

This proposal is designed to enhance the safety of helicopter operations over that of VFR operation in marginal weather by facilitating entry of helicopters into the IFR system in a manner commensurate with their operational characteristics.

REGULATORY EVALUATION SUMMARY

Both the executive and legislative branches of government recognize that economic considerations are an important factor in establishing regulations. Executive Order 12866, signed by President Clinton on September 30, 1993, requires Federal

agencies to assess both the costs and benefits of proposed regulations and, recognizing that some costs and benefits are difficult to quantify, to propose or adopt regulations only upon a reasoned determination that the benefits of each regulation justify its costs. In addition, the Regulatory Flexibility Act of 1980 requires Federal agencies to determine whether proposed regulations are expected to have a significant economic impact on a substantial number of small entities, and, if so, to examine feasible regulatory alternatives to minimize the economic burden on small entities. Finally, the Office of Management and Budget directs agencies to assess the effects of proposed regulations on international trade.

Benefits

There are some non-quantifiable benefits that can be attributed to this proposed rulemaking, such as the reduction in the level of aircraft sound experienced by individuals on the ground when helicopters fly at higher altitudes. These benefits are difficult to measure accurately, and are discussed in qualitative terms. Other benefits are more quantifiable and are derived from the reduction in the number of fatal and serious accidents that occur in marginal weather

conditions. The estimated reduction in the number of accidents is due to the increased level of safety afforded pilots that fly IFR. These benefits are classified as quantitative.

A. Qualitative Benefits

Because of the lack of feasible alternatives to VFR, during periods of marginal or inclement weather conditions, a helicopter operator often will abandon his or her IFR flight plan and fly either VFR or Special VFR at lower altitudes. By flying at lower altitudes, third party costs (increased level of aircraft sound), are experienced by individuals on the ground.

Aircraft sound is a function, in part, of aircraft altitude, and sound energy can be reduced by increasing the flight altitude. Therefore, by providing the opportunity to increase the altitude of a helicopter flight in instrument meteorological conditions (IMC), the proposed rule would help to reduce the sound energy on the ground generated by that helicopter. For example, if a helicopter flying VFR at 250 ft above ground level (AGL) in weather conditions is able to fly IFR at 4,000 ft AGL in the same marginal weather conditions, the reduction in sound energy is 24 dB, which

represents a decrease to less than one-hundredth the level of sound intensity experienced by third parties on the ground.

Another benefit of this NPRM that is difficult to quantify is reducing the opportunity cost of idle resources. Opportunity cost is a forward-looking view of costs that are forgone by not putting a firm's resources to their highest uses. During periods of marginal or adverse weather conditions, many corporate helicopter flight operations are canceled rather than attempted under VFR. A portion of the opportunity cost can be measured by the lost productivity associated with the extra time involved by senior executives using alternate forms of transportation, such as automobiles. With the average annual chief executive compensation at $2.3 million, an hour delay could amount to as much as $1,100, plus the salaries of other senior executives traveling with the chief executive, plus the cost of the helicopter and pilot sitting idle. By enabling more helicopter pilots to operate under IFR in marginal weather conditions, these opportunity costs could be avoided.

B. Quantitative Benefits

The quantitative benefits of this proposed rulemaking are derived from a reduction in weather related accidents.

Weather related accidents are a common, serious type of accident experienced by helicopter operators, but the incidence of this type of accident can be reduced by enhanced helicopter access to the IFR system.

Data was compiled regarding helicopter accidents in which weather was a cause or factor over the 10 year period from 1986 to 1995. These data were obtained from the National Transportation Safety Board (NTSB) data base. The most recent accidents that occurred in 1996 are still under review and have not been placed into the NTSB data base. Because the data for 1996 is not complete, no data from 1996 are used in this analysis.

There were 215 helicopter accidents from 1986 to 1995 in which no flight plan was filed and weather was a cause or factor. That number of accidents is approximately 36 times greater than the six accidents that occurred under an IFR flight plan. In addition, 69 accidents occurred in which VFR flight plans were filed. This is approximately 12 times greater than the six accidents under IFR operation. When the 215 accidents are added to the 69 accidents, the result is a total of 284 accidents, which represents approximately 98 percent of all the accidents that occurred during the subject time interval in which weather was a cause or factor. These

statistics suggest the potential safety benefits of flying IFR in IMC.

When the fatalities sustained flying with no flight plan (95) are added to the fatalities sustained flying with a VFR flight plan (69), the result is 164 fatal injuries. That represents a fatality rate more than 5 times the 31 fatal injures sustained under an IFR flight plan. Similarly, when serious injuries sustained flying with no flight plan (34) are added to the serious injuries sustained flying with a VFR flight plan (27), the result is 61, compared to only one serious injury sustained in IFR flight.

In the aggregate, fatal and serious injuries that occurred when no IFR flight plan was filed are approximately 7 times those that occurred under an IFR flight plan. The FAA is aware that even though weather was a cause or contributing factor in all of these accidents, this proposed rulemaking would not have prevented all of these accidents or injuries; however, the data suggest IFR flight is safer than VFR flight when marginal weather conditions are present.

The FAA believes that 35 fatalities and injuries from 15 accidents could have been prevented if the proposed rule had been in effect. In addition to weather being a cause or contributing factor, all of the pilots involved in these

accidents had instrument ratings for helicopters, as well as airplanes. To determine the potential benefits that would result from this proposed rule, the FAA estimated the average costs associated with the accidents from VFR flight into IMC when the pilot in command was instrument rated for helicopters. A critical economic value of $2.7 million and $518,000 was applied to each human casualty and serious injury, respectively. This computation resulted in an estimate of approximately $62 million in casualty costs. Also, the value of the destroyed aircraft was estimated to be $8 million. If this rulemaking helps prevent the reoccurrence of these accidents, the expected potential safety benefits over the next ten years would be approximately $70 million ($49 million, discounted).

Costs

The proposed rule is not imposing any additional equipment, training, or other cost on the aviation industry. Therefore, the FAA believes there is no apparent compliance cost associated with the proposed rule. However, the FAA solicits comments regarding the extent and plausibility of the adverse impacts on operators that feel they would be impacted from implementation of the proposed rule.

Comparison of Costs and Benefits

The NPRM would not place any additional requirements on the aviation industry. Therefore, there is no compliance cost associated with the proposed rule. Qualitative benefits from the proposed rule would come from reducing the level of aircraft sound experienced by individuals on the ground and from cost savings associated with reducing transportation time. The quantitative benefits come from a reduction in accidents by enabling more helicopter pilots to operate under IFR in marginal weather conditions. Over the next 10 years, the estimated safety benefit of the proposed rule would be $70 million or $49 million, present value. Therefore, the FAA has determined that the proposed rule is cost beneficial.

Initial Regulatory Flexibility Assessment

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by Government regulations. The RFA requires agencies to specifically review rules that may have a "significant economic impact on a substantial number of small entities."

This final rule will impact entities regulated by 14 CFR part 91. The FAA's criteria for "a substantial number" are a number which is not less that 11 and which is more than one-third the number of small entities subject to this rule. For all carriers, a small entity has been defined as one which owns, but does not necessarily operate, nine or fewer

aircraft. The FAA's criteria for "a significant impact" are as follows: At least $5,000 per year for an unscheduled air carrier, $70,800 per year for a scheduled carrier having only 60 or fewer passenger seats in it's aircraft fleet, and $126,600 per year for a scheduled carrier having 61 or more passenger seats in it's aircraft fleet.

Using these criteria, the FAA has determined that the proposed amendments to § 91.167 and § 91.169, if promulgated, will not have a significant economic impact on a substantial number of small entities. None of the proposed amendments will significantly affect air carrier costs.

International Trade Impact Statement

This proposed rule is not expected to impose a competitive disadvantage to either US air carriers doing business abroad or foreign air carriers doing business in the United States. This assessment is based on the fact that this proposed rule would not impose additional costs on either US or foreign air carriers. This proposal would have no effect on the sale of foreign aviation products or services in the United States, nor would it affect the sale of United States aviation products or services in foreign countries.

Unfunded Mandates Reform Act Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, requires

each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. § 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that would impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. § 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain any Federal intergovernmental or private sector mandate. Therefore, the requirements of

Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Federalism Implications

The proposed regulations do 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 various levels of government. Thus, in accordance with Executive Order 12612, it is determined that this proposed regulation does not have federalism implications warranting the preparation of a Federalism Assessment.

Conclusion

For the reasons set forth under the heading "Regulatory Analysis," the FAA has determined that this proposed regulation: (1) is **[NOT?]** a significant rule under Executive Order 12866; and (2) is **[NOT?]** a significant rule under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). Also, for the reasons stated under the headings "Trade Impact Statement" and "Regulatory Flexibility Determination," the FAA certifies that the proposed rule would **[NOT?]** have a significant economic impact on a substantial number of small entities. A copy of the full regulatory evaluation is filed in the docket and may

also be obtained by contacting the person listed under "**FOR FURTHER INFORMATION CONTACT.**"

List of Subjects

14 CFR Part 91

Aircraft, Airports, Aviation safety.

THE PROPOSED AMENDMENT

In consideration of the foregoing, the FAA proposes to amend part 91 of the Federal Aviation Regulations (14 CFR part 91) as follows:

PART 91 -- GENERAL OPERATING AND FLIGHT RULES

1. The authority citation for part 91 continues to read as follows:

Authority: 49 U.S.C. app. 1301(7), 1303, 1344, 1348, 1352 through 1355, 1401, 1421 through 1431, 1471, 1472, 1502, 1510, 1522, 2121 through 2125; Articles 12, 29, 31, and 32(a) of the Convention on International Civil Aviation (61 stat. 1180); 42 U.S.C. 4321 et seq.; E.O. 11514, 35 FR 4247, 3 CFR, 1966-1970 Comp., p. 902; 49 U.S.C. 106(g).

2. Section 91.167 is amended by revising paragraph (b) to read as follows:

§ 91.167 Fuel requirements for flight in IFR conditions.

* * * * *

(b) Paragraph (a)(2) of this section does not apply if--

(1) Part 97 of this chapter prescribes a standard instrument approach procedure for the first airport of intended landing; and

(2) The weather reports or prevailing weather forecast or combination of them indicate--

(i) For airplanes, for at least 1 hour before and 1 hour after the estimated time of arrival, the ceiling will be at least 2,000 feet above the airport elevation; for helicopters, at the estimated time of arrival, the ceiling will be 1,000 feet above the airport elevation or 400 feet above the lowest approach minima, whichever is higher; and

(ii) For airplanes, for at least 1 hour before and 1 hour after the estimated time of arrival, the visibility will be at least 3 statute miles; for helicopters, at the estimated time of arrival, the visibility will be at least 2 statute miles.

3. Section 91.169 is amended by revising paragraphs (b) and (c) to read as follows:

§ 91.169 IFR flight plan: Information required.

* * * * *

(b) Exceptions to applicability of paragraph (a)(2) of this section. Paragraph (a)(2) of this section does not apply if part 97 of this chapter prescribes a standard instrument approach procedure for the first airport of intended landing and the weather reports or prevailing weather forecast or combination of them indicate--

(1) For airplanes, for at least 1 hour before and 1 hour after the estimated time of arrival, the ceiling will be at least 2,000 feet above the airport elevation; for helicopters, at the estimated time of arrival, the ceiling will be at least 1,000 feet above the airport or heliport elevation or 400 feet above the lowest approach minima, whichever is higher; and

(2) For airplanes, for at least 1 hour before and 1 hour after the estimated time of arrival, the visibility will be at least 3 statute miles; for helicopters, at the estimated time of arrival, the visibility will be at least 2 statute miles.

(c) IFR alternate airport weather minimums. Unless otherwise authorized by the Administrator, no person may include an alternate airport in an IFR flight plan unless current prevailing weather forecasts indicate that at the estimated time of arrival at the alternate airport, the ceiling and visibility at that airport will be at or above the following alternate airport weather minimums:

(1) If an instrument approach procedure has been published in part 97 of this chapter for that airport, the

alternate airport minimums specified in that procedure, or, if none are so specified, the following minimums:

(i) Except as provided in paragraph (c)(2) of this section, precision approach procedure: For airplanes, Ceiling 600 feet and visibility 2 statute miles; for helicopters, Ceiling 400 feet and visibility 1 statute mile.

(ii) Except as provided in paragraph (c)(2) of this section, nonprecision approach procedure: For airplanes, Ceiling 800 feet and visibility 2 statute miles; for helicopters, Ceiling 600 feet and visibility 1 statute mile.

(2) If no instrument approach procedure has been published in part 97 of this chapter for that airport, the ceiling and visibility minimums are those allowing descent from the MEA, approach, and landing under basic VFR.

* * * * *

Issued in Washington, D.C., on

U.S. Department
of Transportation

FEDERAL AVIATION
ADMINISTRATION
Office of Aviation Policy and Plans
Washington, D.C. 20591

DRAFT REGULATORY EVALUATION, INITIAL REGULATORY FLEXIBILITY DETERMINATION, UNFUNDED MANDATES REFORM ACT, AND TRADE IMPACT ASSESSMENT

FLIGHT PLAN REQUIREMENTS FOR HELICOPTER OPERATIONS UNDER INSTRUMENT FLIGHT RULES

NOTICE OF PROPOSED RULEMAKING
(14 CFR, PART 91)

OFFICE OF AVIATION POLICY AND PLANS
OPERATIONS REGULATORY ANALYSIS BRANCH, APO-310
Paul E. Jorgensen
July, 1997

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This regulatory evaluation examines the benefits and costs associated with the proposed rule to amend 14 CFR parts 91.167 (b) and 91.169 (b) and (c) that pertain to the flight plan requirements for helicopter operations under instrument flight rules. The purpose of this rulemaking is to facilitate helicopter pilots access to the IFR system. The proposed rule would revise the destination airport criteria for specifying an alternate airport and the weather minimums necessary to designate an alternate airport on a flight plan.

The NPRM would not place any additional requirements on the aviation industry. Therefore, there is no compliance costs associated with the proposed rule. The proposed rule would achieve potential safety benefits of $70 million ($49 million, present value) over the next 10 years. In addition, there are the non-quantified benefits of reduced aircraft noise at ground level, and the lessening of helicopter idle time due to adverse or marginal weather conditions.

The proposed rule would not present a significant impediment to either U.S. firms doing business abroad, or foreign firms doing business in the United States. Furthermore, the FAA has determined that the proposed rule would not have a significant economic impact on a substantial number of small entities.

I. INTRODUCTION

In an effort to promulgate regulations that improve aviation safety and promote efficiency, this notice of proposed rulemaking (NPRM) puts forth the recommendations of the Federal Aviation Administration (FAA) and the Aviation Rulemaking Advisory Committee (ARAC). This regulatory evaluation examines the costs and benefits of the proposed rule to amend 14 CFR part 91.167 (b), and 14 CFR part 91.169 (b) and (c). These amendments pertain to flight plan requirements for helicopter flights under instrument flight rules (IFR) by revising: (1) the destination airport criteria for specifying an alternate airport, and (2) the weather minimums necessary to designate an alternate airport in a flight plan.

Marginal weather conditions that result in inadvertent flights into Instrument Meteorological Conditions (IMC) is one of the more serious hazards that helicopter pilots encounter. This proposal will enable more helicopter pilots to operate under IFR in marginal weather conditions. By allowing more IFR helicopter flights during marginal weather conditions in place of VFR flights, the occurrence of inadvertent VFR flights into IMC should be reduced.

II. BACKGROUND

A person operating a civil aircraft under IFR must comply with the IFR fuel requirements of § 91.167 and the IFR flight plan requirement of § 91.169. If a person cannot meet the reserve fuel requirements of § 91.167, or the flight plan requirements and criteria for specifying an

alternate airport in § 91.169, then he or she may not file an IFR flight plan, and must fly under VFR. Therefore, anyone who cannot comply with the current regulations has only two options: either fly VFR or do not fly at all.

Sections 91.167 and 91.169 were originally established to cover all aircraft, but particularly airplanes, operating under IFR. Other than the distinction in § 91.167 concerning the amount of fuel a helicopter must carry versus the amount of fuel an airplane must carry, flight planning requirements, including alternate airport weather minimums, are the same for both airplanes and helicopters, even though their operating characteristics are quite different.

The FAA recognizes that helicopter operations are more range limited and more flight-time limited than airplane operations. Helicopters fly shorter distances at slower speeds than airplanes, and generally remain in the air for shorter periods between refueling stops. Therefore, it is unlikely that a helicopter operator will fly out of adverse weather, as opposed to an airplane, which can fly greater distances at faster speeds. Since a helicopter is usually in the air for a shorter time than an airplane, the helicopter pilot is more likely to encounter weather conditions consistent with earlier forecasts at the destination helipad, than an airplane pilot will at his or her destination airport. Consequently, the weather forecast for the flight destination at the estimated time of arrival (ETA) is more likely to prove accurate for helicopter operations than for airplane operations, and flight planning for helicopter operations should be based on the destination forecast at ETA rather than one hour before to one hour after ETA. Focusing on weather

forecasts for times, such as one hour before to one hour after ETA, are not as relevant and do not add anything towards the safe operation of the helicopter.

III. BENEFITS

There are some non-quantifiable benefits that can be attributed to this proposed rulemaking, such as the reduction in the level of aircraft noise experienced by individuals on the ground when helicopters fly at higher altitudes. These benefits are difficult to accurately measure, and are discussed in qualitative terms. Other benefits are more quantifiable and are derived from the reduction of the number of fatal and serious accidents that occur in marginal weather conditions. The estimated reduction in the number of accidents is due to the increased level of safety afforded pilots that fly IFR. These benefits are classified as quantitative.

A. Qualitative Benefits

Because of the lack of feasible alternatives to VFR, during periods of marginal or inclement weather conditions, a helicopter operator often will abandon his or her IFR plan and fly either VFR or Special VFR at lower altitudes. By flying at lower altitudes, third party costs (increased level of aircraft noise), are experienced by individuals on the ground.

Noise has the potential to annoy because of interference with speech, sleep, work, or other activities[1]. Aircraft noise is a function of aircraft altitude, and noise or sound energy can be reduced by increasing the flight altitude.[2] Therefore, by providing the opportunity to increase the altitude of a helicopter flight during IMC, the proposed rule would help to reduce the sound energy on the ground generated by that helicopter. For example, if a helicopter flying VFR at 250 ft above ground level (AGL) in marginal weather conditions is able to fly IFR at 4,000 ft AGL in the same marginal weather conditions, the reduction in sound energy is 24 dB[3], which represents a decrease to less than one-hundredth the level of sound intensity experienced by third parties on the ground.

Another benefit of this NPRM that is difficult to quantify is reducing the opportunity cost of idle upper management time. Opportunity cost is a forward-looking view of costs that are forgone by not putting a firm's resources to its highest use. Due to the high level of concern many companies have regarding the safety of their senior executives, the safe operation of their corporate helicopter receives a high priority. As such, during periods of marginal or adverse

---

[1] Noise is commonly defined as unwanted sound, and so the measurement of noise is linked to the measurement of sound. The basic unit of sound measurement is the decibel (dB), which is a logarithmic transformation of sound energy. The logarithmic scale permits a relatively narrow scale to represent a wide range of sound energy that can be detected by the human ear. Consequently, the decibel ladder is a scale of reference and not a measure of absolute physical quantities. As explained in *The Economic Value of Peace and Quiet*, Starkie, D. N. M and Johnson, D. M., Saxon House and Lexington Books, D. C. Heath & Co., Lexington, MA, 1975., p 3., 30 decibels is a soft whisper, while 60 decibels represents moderate speech heard at about a yard. These changes differ dramatically in sound energy; the increase from 30 dB to 60 dB represents a thousand fold increase in sound intensity.

[2] Analysis and Evaluation Branch, Office of Environment and Energy, Federal Aviation Administration. Sound or noise energy can be reduced by 6 dB for each doubling in altitude.

[3] Sound energy is reduced by 6 dB for each doubling in altitude, sound energy will be reduced by 24 dB if the altitude is doubled four times (500 ft, 1,000 ft, 2,000 ft, and 4,000 ft). A reduction of 20 dB represents a hundred-fold decrease in sound intensity.

weather conditions, most corporate operations are canceled rather than attempt to fly VFR under those conditions. A portion of the opportunity cost can be measured by the lost productivity associated with the extra time involved by senior executives using alternate forms of transportation, such as automobile. With the average annual chief executive compensation at $2.3 million,[4] an hour delay could amount to as much as $1,100, not including the salaries of other senior executives traveling with the chief executive, or the cost of the helicopter and pilot sitting idle due to marginal or adverse weather conditions. By enabling more helicopter pilots to operate under IFR in marginal weather conditions, these opportunity costs could be avoided.

B. Quantitative Benefits

The quantitative benefits of this proposed rulemaking are derived from a reduction in weather related accidents. Weather related accidents are a common, serious type of accident experienced by helicopter operators, but this type of accident can be prevented by enhanced helicopter operator access into the IFR system.

Table 1 below illustrates the helicopter accidents where weather was a cause or factor over the a 10 year period from 1986 to 1995. These data used was obtained from the National Transportation Safety Board (NTSB) data base. The most recent accidents that occurred in 1996 are still under review. As such, the accidents under review have not been placed into the NTSB

[4] "Executive Pay." Business Week, April 21, 1997.

data base, and, as a result, the data for 1996 is not complete. Therefore, due to the incompleteness, no data from 1996 is used in this analysis.

TABLE 1
Helicopter Accidents Where Weather was a Cause or Factor

Year	Flight Plan		
	IFR	VFR	NONE
1986	1	6	25
1987	2	3	29
1988	0	6	22
1989	0	10	25
1990	0	4	30
1991	0	8	15
1992	0	11	18
1993	1	8	23
1994	1	11	12
1995	1	2	16
TOTAL	**6**	**69**	**215**

Source: National Aviation Safety Data Analysis Center, March 1997.

As shown in Table 1, there were 215 helicopter accidents since 1986, where no flight plan was filed and weather was a cause or factor. That number of accidents involving VFR flights is approximately 36 times greater than the six accidents that occurred under an IFR flight. In addition, the 69 accidents where VFR flight plans were filed is approximately 12 times greater than the six in IFR operation. When the 215 accidents are added to the 69 accidents, the result is a total of 284 accidents which represents approximately 98 percent of all the accidents that occurred when weather was a cause or factor. These statistics suggest the potential safety benefits of flying IFR in IMC.

Injuries sustained in weather related helicopter accidents are illustrated in Table 2. When the fatalities sustained flying with no flight plan (95) are added to the fatalities sustained flying with a VFR flight plan (69) the result is 164 fatal injuries. That represents a fatality rate more than

TABLE 2
Injuries Sustained in Helicopter Accidents
Where Weather Was a Cause or Factor

	No Flight Plan		VFR Flight Plan		IFR Flight Plan	
Year	Fatal	Serious	Fatal	Serious	Fatal	Serious
1986	25	2	6	3	4	0
1987	9	5	4	0	17	0
1988	5	5	4	6	0	0
1989	5	6	3	7	0	0
1990	9	2	6	5	0	0
1991	6	2	11	0	0	0
1992	12	3	13	3	0	0
1993	16	5	2	1	3	1
1994	1	3	14	2	4	0
1995	7	1	6	0	3	0
TOTAL	95	34	69	27	31	1

Source: National Aviation Safety Data Analysis Center, March 1997.

5 times the 31 fatal injures[5] sustained under a IFR flight plan. Similarly, when serious injuries sustained flying with no flight plan (34) are added to the serious injuries sustained flying with a VFR flight plan (27), the result is 61, compared to only one serious injury sustained in IFR flight. In aggregate, the fatal and serious injuries that occurred when no IFR flight plan was filed is approximately 7 times those that occurred under an IFR flight plan. The FAA is aware that even thought weather was a cause or contributing factor in all of these accidents, this proposed rulemaking would not have prevented all of these accidents or injuries, however the data from

[5] According to the NTSB data base, there were 31 fatalities in the IFR flight plan. However, upon closer inspection, it appears 18 of those fatalities occurred after the pilot in command had switched from IFR to VFR. As a result, only 13 fatalities occurred in the past 11 years when the pilot was flying within the IFR system. That would increase to 93 percent the percentage of fatal injuries attributable to flight outside of the IFR system.

Table 1 and Table 2 suggest IFR flight is safer than VFR flight when marginal weather conditions are present.

The FAA believes that the fatalities and injuries shown in Table 3 could have been prevented if the proposed rule had been in effect. In addition to weather being a cause or contributing factor, all of the pilots involved in these accidents had instrument ratings for helicopters, as well as airplanes.

TABLE 3
Injuries Sustained from VFR flight into IMC Conditions
Pilot in Command Helicopter Instrument Rated

Injury Type	No Flight Plan	VFR Flight Plan	Total
Fatal	8	12	20
Serious	6	9	15

Source: National Aviation Safety Data Analysis Center, March 1997.

To determine the potential benefits that would result from this proposed rule, the FAA estimated the average costs associated with the accidents illustrated in Table 3. A critical economic value of $2.7 million and $518,000 was applied to each human casualty and serious injury, respectively.[6] This computation resulted in an estimate of approximately $62 million[7] in casualty costs. Also, the value of the destroyed aircraft was estimated to be $8 million.[8] If this

[6] Based on critical economic value guidelines developed by the U. S. Department of Transportation.

[7] Calculated at follows: $2.7 million times 20 fatalities equals $54,000,000 and $518,000 times 15 serious injuries equals $7,770,000. Adding $54,000,000 and $7,770,000 equals $61,770,000 rounded to $62 million.

[8] Estimates based on values listed in Airclaims, International Aircraft Price Guide, Winter, 1996. Values used represented the lowest in a range for each make and model helicopter involved. Actual estimated value of destroyed aircraft was $8,346,000.

rulemaking helps prevent the reoccurrence of the accidents shown in Table 3, the expected potential safety benefits over the next ten years would be approximately $70 million ($49 million, discounted), as shown in Table 4.

TABLE 4
Expected Value of Potential Safety Benefits
(1996 dollars)

Year	Annual Safety Benefits		Discounted Safety Benefits
1998	$ 7,011,660		$ 6,552,953
1999	$ 7,011,660		$ 6,124,255
2000	$ 7,011,660		$ 5,723,603
2001	$ 7,011,660		$ 5,349,162
2002	$ 7,011,660		$ 4,999,217
2003	$ 7,011,660		$ 4,672,165
2004	$ 7,011,660		$ 4,366,509
2005	$ 7,011,660		$ 4,080,850
2006	$ 7,011,660		$ 3,813,878
2007	$ 7,011,660		$ 3,564,372
Total	$ 70,116,600		$ 49,246,966

Source: U. S. Dept. of Trans., FAA, APO-310, June, 1997

IV. COSTS

The proposed rule is not imposing any additional equipment, training, or other cost to the aviation industry. Therefore, the FAA believes there is no apparent compliance cost associated with the proposed rule. However, the FAA solicits comments regarding the extent and plausibility of the adverse impacts on operators that feel they would be impacted from implementation of the proposed rule.

V. COMPARISON OF COSTS AND BENEFITS

The NPRM would not place any additional requirements on the aviation industry. Therefore, there is no compliance costs associated with the proposed rule. Qualitative benefits from the proposed rule would come from reducing the level of aircraft noise experienced by individuals on the ground and from cost savings associated with reducing transportation time for high level corporate executives. The quantitative benefits come from a reduction in accidents by enabling more helicopter pilots to operate under IFR in marginal weather conditions. Over the next 10 years, the estimated safety benefit of the proposed rule would be $70 million or $49 million, present value. Therefore, the FAA has determined that the proposed rul e is cost beneficial.

VI. INITIAL REGULATORY FLEXIBILITY ASSESSMENT

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by Government regulations. The RFA requires agencies to specifically review rules that may have a "significant economic impact on a substantial number of small entities."

This final rule will impact entities regulated by part 91. The FAA's criteria for "a substantial number" are a number which is not less that 11 and which is more than one-third the number of small entities subject to this rule. For all carriers, a small entity has been defined as one which owns, but does not necessarily operate, nine or fewer aircraft. The FAA's criteria for "a

significant impact" are as follows: At least $5,000 per year for an unscheduled air carrier, $70,800 per year for a scheduled carrier having only 60 or fewer passenger seats in it's aircraft fleet, and $126,600 per year for a scheduled carrier having with 61 or more passenger seats in it's aircraft fleet.

Using these criteria, the FAA has determined that the initial amendments to § 91.167 and § 91.169, if promulgated, will not have a significant economic impact on a substantial number of small entities. None of the initial amendments will have a significant affect on air carrier costs.

VII. INTERNATIONAL TRADE IMPACT STATEMENT

This proposed rule is not expected to impose a competitive disadvantage to either US air carriers doing business abroad or foreign air carriers doing business in the United States. This assessment is based on the fact that this proposed rule would not impose additional costs on either US or foreign air carriers. This proposal would have no effect on the sale of foreign aviation products or services in the United States, nor would it affect the sale of United States aviation products or services in foreign countries.

VIII. UNFUNDED MANDATES REFORM ACT ASSESSMENT

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a

written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that would impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain any Federal intergovernmental or private sector mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

FAA Action

FAA Action: NPRM FAA-1998-4390
SNPRM FAA-1998-4390

70883

Federal Register

Friday,
January 21, 2000

FAA-98-4390-58

Part II

Department of Transportation

Federal Aviation Administration

14 CFR Parts 21, 27, 29, and 91
Fright Plan Requirements for Helicopter Operational Under Instrument Flight Rules; Final Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 21, 27, 29, and 91

[Docket No. FAA–98–4390; Amendment No. 21–76, 27–39, 29–46, 91–259]

RIN 2120–AG53

Flight Plan Requirements for Helicopter Operations Under Instrument Flight Rules

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is amending instrument flight rules (IFR) for helicopters by revising alternate airport weather planning requirements, weather minima necessary to designate an airport as an alternate on an IFR flight plan, and fuel requirements for helicopter flight into IFR conditions. This action will provide operators with an additional margin of safety by easing access of helicopters to the IFR system, result in a reduction of noise heard on the ground, and increase the ability of operators to use helicopters more efficiently.

EFFECTIVE DATE: January 21, 2000.

FOR FURTHER INFORMATION CONTACT: William H. Wallace, General Aviation Commercial Division (AFS–804), Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone (202) 267–3771.

SUPPLEMENTARY INFORMATION:

Availability of Final Rules

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the FedWorld electronic bulletin board service (telephone: (703) 321–3339) or the Government Printing Office's (GPO) electronic bulletin board service (telephone: (202) 512–1661).

Internet users may reach the FAA's web page at: http://www.faa.gov/avr/arm/nprm/nprm.htm or the GPO's web page at http://www.access.gpo.gov/nara for access to recently published rulemaking documents.

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-l, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267–9680. Communications must identify the amendment number or docket number of this final rule.

Persons interested in being placed on the mailing list for future rulemaking documents should request from the above office a copy of Advisory Circular No. 1 1–2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires the FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. Therefore, any small entity that has a question regarding this document may contact their local FAA official. Internet users can find additional information on SBREFA on the FAA's web page at *http://www.faa.gov/*avr/arm/sbrefa/htm and may send electronic inquiries to the following internet address: *9-AWA-SBREFA@faa.gov.*

Background

The FAA issued a Notice of Proposed Rulemaking (NPRM) (63 FR 46834; Sept. 2, 1998) that proposed to amend the general operating rules for helicopters by revising alternate airport weather planning requirements, weather minima necessary to designate an airport as an alternate on an IFR flight plan, and the fuel requirements for helicopter flight into IFR flight conditions. The NPRM also proposed to withdraw Special Federal Aviation Regulation (SFAR) No. 29–4, Limited IFR Operations of Rotorcraft. The public comment period closed on October 2, 1998.

The FAA later issued a Supplemental Notice of Proposed Rulemaking (SNPRM) (64 FR 35902; July 1, 1999) that sought comments on modifications made to the NPRM in response to commenters' suggestions. The public comment period for the SNPRM closed on August 2, 1999.

Statement of the Problem

Flight planning requirements (including alternate airport weather minima) for helicopters and other aircraft are virtually identical, even though their operating characteristics are substantially different. The only distinction between the flight planning requirements for helicopters and other aircraft is addressed in 14 CFR 91.167, which specifies different requirements for the amount of fuel helicopters and other aircraft must carry after completing a flight to the first airport of intended landing. Helicopters, however, fly shorter distances at slower airspeeds than most other aircraft, and they generally remain in the air for shorter periods between landings. A helicopter is therefore less likely to fly into unanticipated, unknown, or unforecast weather. The relatively short duration of the typical helicopter flight means that the departure weather and the destination weather are likely to be within the same weather system. This final rule revises the flight planning requirements for helicopter IFR operations to take into account their unique operating characteristics.

History

Over the past several years, there have been specific recommendations from industry, and from joint efforts of the FAA and industry regarding regulatory changes to safely expand helicopter access to the IFR system. The FAA has been addressing these recommendations by working with industry to identify regulations that prevent safe helicopter operations in the IFR environment.

Previous Rulemakings

In January 1975, the FAA issued Special Federal Aviation Regulation (SFAR) No. 29 (40 FR 2420; Jan. 13, 1975), which authorized the carriage, in rotorcraft IFR operations, of less than the 45 minutes, but not less than the 30 minutes, of additional fuel reserve, then required by § 91.23 (c) (now § 91.167(a)(3)), when approved by the Administrator. The SFAR also authorized the issuance of approvals for limited IFR operations for certain transport category rotorcraft that are certified to only operate under VFR. In 1979, the FAA undertook the Rotorcraft Regulatory Review Program (44 FR 3250; Jan. 15, 1979), which was a comprehensive review of rotorcraft operations and certification.

In an NPRM issued in 1985 (50 FR 10144; March 13, 1985), the FAA proposed to amend § 91.23 (now § 91.167) by reducing the fuel reserve requirement for helicopters from 45 minutes to 30 minutes. The FAA also proposed to amend the alternate airport IFR flight plan filing requirements by reducing the ceiling minimum for helicopters from 2,000 feet to 1,000 feet, and the visibility minimum for helicopters from 3 miles to 1 mile. No changes were proposed to § 91.83 (now § 91.169). As the FAA stated in the preamble to the 1985 NPRM, the basis for the proposed reductions was that a helicopter has the unique ability to reduce airspeed safely on approach to as low as 40 knots, and is therefore provided reduced visibility minima in part 97. The proposal also said that because the helicopter, with its reduced minima, has a better probability of completing the flight to the planned

destination, it should be allowed a reduced fuel reserve. In the 1985 NPRM, the FAA also stated that it had gained sufficient experience with operations under SFAR No. 29 to conclude that reducing the required fuel reserve would not decrease the level of safety.

In 1986, the FAA issued a final rule (51 FR 40692; Nov. 7, 1986) that adopted the proposal to reduce the fuel reserve required under § 91.23. The FAA did not, however, adopt the proposal to reduce the ceiling and visibility minima because a report entitled "Weather Deterioration Models Applied to Alternate Airport Criteria (Report No. DOT/FAA/RD 81/92 (September 1981) had stated that "any reduction in alternate airport requirements should be offset by limiting the duration of the flight for which the reduced requirements apply" (p. 4–1). The findings in that report, however, were preliminary, and in the years that have passed since it was issued, the FAA's experience with helicopter IFR flight plan filing criteria indicates that the preliminary concern for reduced helicopter ceiling and visibility minima was overemphasized.

U.S. *Army Practices*

In 1982, the U.S. Army adopted reduced IFR alternate airport weather planning minima and alternate airport selection criteria for both helicopters and airplanes. The Army's criteria of a ceiling 400 feet above the weather planning minimum required for the approach to be flown, and visibility one mile greater than the weather planning minimum required for the approach to be flown has been used for over 17 years and there have been thousands of flight hours with no mishaps associated with these weather planning criteria. The U.S. Army's experience demonstrates that reducing helicopter ceiling and visibility minima for IFR flight planning results in a level of safety equivalent to the current rule and offers greater operational flexibility for helicopter operators.

ELVIRA Workshop

In August 1993, a workshop conducted by the FAA with industry, called the Extremely Low Visibility Instrument Rotorcraft Approaches (ELVIRA) Workshop, resulted in a list of "Ten Most Wanted" changes (see "Extremely Low Visibility IFR Rotorcraft Approach (ELVIRA) Operational Concept Development, Final Report," Report No. DOT/FAA/RD–94/1 ,I. (March 1994)). The unprioritized list of 10 desired IFR system enhancements included "rotorcraft specific minima" for determining the need for, and availability of, alternate airports for flight plan filing purposes (ELVIRA final report, p. 3).

Since rotorcraft are for the most part range-limited, their destination airport and alternate airport will most likely be in the same air mass and consequently will have similar weather. In the ELVIRA final report (p. 34), the FAA noted that the current regulations result in a "severe penalty in the productivity of helicopters operating under IFR." In addition, the FAA observed that "with certain weather conditions it is often impossible for the helicopter operator to gain access to the current IFR system, while VFR flight is allowed. * * * [C]hanging this [the alternate airport minima] to 400–1 for a [helicopter] precision approach and 600–1 for a [helicopter] non-precision approach procedure, will enable many more [helicopter] IFR operations to take place while maintaining the same level of safety" (pp. 34–35).

Petitions for Exemption

On February 23, 1995, Helicopter Association International (HAI) petitioned the FAA for an exemption from § 91.169 (c)(l)(i), which provides that alternate airport minima for a precision approach are a ceiling of 600 feet and visibility of 2 statute miles. The petition asked the FAA to allow lower alternate airport weather minima for IFR flight planning.

On April 24, 1996, HAI filed an amendment to its petition for exemption from § 91.169 (c)(l)(i), proposing, in part, to limit operations under the requested exemption to those conducted by certain operators named in the amended petition. The stated purpose of this amendment was the further "accumulation of data to prove the operational safety of the use of such minimums." In addition, the FAA has received 13 other petitions requesting amendments to § § 91.169 and 91.167 to allow helicopter operations with reduced alternate weather requirements. (With the issuance of the NPRM published on September 2, 1998, the FAA closed the docket on HAI's petition for exemption, and on the petitions submitted by HAI and others for various amendments to § § 91.169, 91.167 and related regulations.) 0

ARAC Actions

The Aviation Rulemaking Advisory Committee (ARAC) was established by the FAA to provide industry information and expertise during the rulemaking process. In October 1991, an IFR Fuel Reserve Working Group of the ARAC, General Aviation Operations Issues, was assigned the task to "evaluate the advantages and disadvantages of revising the fuel reserve requirements for flight under instrument flight rules" (56 FR 51744; Oct. 15, 1991). Later the working group also evaluated: (1) The advantages and disadvantages of revised precision and non-precision instrument approach minima and alternate weather minima, considering the operational capability of the helicopter to decelerate before and during arrival at the Decision Height or Minimum Descent Altitude, including circling approaches; and (2) whether or not this capability reduces risk and the probability of a missed approach and the need to proceed to an alternate and meet the resulting regulatory alternate fuel requirement. The working group, which consisted of representatives from helicopter associations, helicopter manufacturers, helicopter pilot associations, helicopter operators, and government agencies, met numerous times between January 1992 and October 1997. As a result, ARAC submitted its recommendation to the FAA in November 1997. The FAA based the NPRM, published on September 2, 1998, and the SNPRM, published on July 1, 1999, on that ARAC recommendation.

ARAC recommended that the FAA revise the weather minima used to determine whether carriage of additional fuel to reach an alternate airport is needed when flying in IFR conditions. Specifically, ARAC suggested revising paragraph (b)(2) of § 91.167—*Fuel requirements for flight in IFR conditions,* to state that: "* • * weather reports or prevailing weather forecast or combination of them indicate * * * for helicopters, at the estimated time of arrival, the ceiling will be 1,000 feet above the airport elevation or 400 feet above the lowest approach minima, whichever is higher; and * • * at the estimated time of arrival, the visibility will be at least 2 statute miles." The ARAC's suggested revisions would create different ceiling and visibility criteria for helicopters (as opposed to those for other aircraft), and would also change the requirement that those ceiling and visibility criteria be in effect for at least 1 hour before and 1 hour after the estimated time of arrival.

ARAC also recommended that IFR flight plan requirements for helicopters be amended by revising the alternate airport weather planning requirements and weather minima necessary when designating an alternate airport on an IFR flight plan. ARAC suggested that the FAA revise paragraph (b) of § 91.169—*IFR fligh t plan: Information required,* to state that the provisions of paragraph

(a)(2) of that section would not apply if 14 CFR part 97 prescribes " * * * a standard instrument approach procedure for the first airport of intended landing and the weather reports or prevailing weather forecast or combination of them indicate * * * for helicopters, at the estimated time of arrival, the ceiling will be at least 1,000 feet above the airport or heliport elevation or 400 feet above the lowest approach minima, whichever is higher; and * * * at the estimated time of arrival, the visibility will be at least 2 statute miles."

Under § 91.169 (c), ARAC again suggested creating IFR alternate weather minima for helicopters performing precision and nonprecision approaches that would be different from those applicable to other aircraft. The new criteria would apply when it would be necessary to include an alternate airport in an IFR flight plan. Ceiling and visibility conditions at the alternate airport would be for "current prevailing weather forecasts * * * at the estimated time of arrival" (when no instrument approach procedure has been specified in 14 CFR part 97 for an alternate airport). The helicopter minima recommended by ARAC were as follows: For a "precision approach procedure * * * for helicopters, [c]eiling 400 feet and visibility 1 statute mile;" and for a "nonprecision approach procedure * * * for helicopters, [c]eiling 600 feet and visibility 1 statute mile."

The FAA agreed with most of ARAC's recommendations, except the elimination of the requirement under §§ 91.167 (b)(2) and 91.169 (b) that weather report and forecast data be in effect for 1 hour after the estimated time of arrival.

Discussion of Comments to the Original NPRM

General

The public comment period on the FAA's September 2, 1998 NPRM closed on October 2, 1998. Thirty-nine comments were received, all of which were generally supportive of the proposal. Commenters praised the NPRM for its potential to enhance safety by facilitating the expansion of helicopter operations under IFR in marginal weather conditions, thereby reducing weather-related accidents. Commenters also stated that adoption of the rule would enable operators to better utilize their IFR-equipped helicopters, transport clients more efficiently, and reduce noise on the ground. Seven commenters however stated that certain technical issues were not adequately addressed by the FAA in the proposal. These concerns are addressed in detail in the following discussion. In addition, since the FAA's economic analysis did not anticipate any cost of compliance or need for additional equipment or training, comments on both the quantitative and qualitative benefits of the proposal were favorable also.

Removal of SFAR No. 29–4

A number of commenters addressed the proposed removal of SFAR No. 29–4, Limited IFR Operations of Rotorcraft. One commenter stated that in the past, his company used the provisions of the SFAR to "prove IFR capabilities in a then non-IFR certified helicopter," and the company "does not want to lose this capability." Two other commenters stated that the FAA should retain the provisions of the SFAR for a period of time (for either a year or a "reasonable time") after the other provisions of the NPRM are implemented as a final rule. The commenters believed that this course of action would have enabled the FAA and industry to determine whether the SFAR was needed or had outlived its usefulness. After that time, the FAA could better evaluate its removal. The FAA does not believe retaining the SFAR is necessary and is therefore removing it.

The SFAR was originally adopted to permit the FAA to collect operational data to study the feasibility of limited rotorcraft operations in IFR conditions. Since the adoption of the SFAR, the FAA has addressed the issue of helicopter IFR operations and issued regulations that govern both the certification and operation of helicopters under IFR. These regulations are found in Appendix B—Airworthiness Criteria for Helicopter Instrument Flight, contained in both 14 CFR parts 27 and 29. Operational regulations permitting helicopters to engage in IFR operations are found in 14 CFR parts 91 and 135.

Paragraph 5 of SFAR 29–4 states that "new applications for limited IFR rotorcraft operations under SFAR No. 29 may be submitted for approval until, but not including the effective date of Amendment No. 1 of the Rotorcraft Regulatory Review Program. On and after the effective date of Amendment No. 1, all applicants for certification of IFR rotorcraft operations must comply with the applicable provisions of the Federal Aviation Regulations." The effective date of Amendment No. 1 was March 2, 1983. Concurrent with the effective date of Amendment No. 1, regulations establishing airworthiness criteria for helicopter instrument flight became effective. All new applicants for certification of helicopter IFR operations must now comply with the provisions of Appendix B of parts 27 or 29, as applicable, and part 91. Because the FAA has established certification criteria and operational limitations for helicopters engaged in IFR operations, the need to prove IFR capabilities in a non-IFR certified helicopter is no longer warranted. The changes made to the regulations since the promulgation of SFAR No. 29 therefore no longer make its provisions necessary.

Alternate Airport Weather Minima

Commenters stated that the NPRM did not provide alternate airport weather minima reductions for helicopters when airports that have non-standard alternate airport weather minima are used as alternate airports. Prior to the adoption of this rule, standard alternate airport weather minima for all aircraft were stated in 14 CFR 91.169 (c)(l)(i) and (ii), (i.e., for a precision approach procedure a ceiling of 600 feet and a visibility of 2 statute miles; for a nonprecision approach procedure, a ceiling of 800 feet and a visibility of 2 statute miles).

The commenters stated that helicopter operators should not be subject to the same restrictions imposed on operators of other types of aircraft by the use of nonstandard alternate minimums. The commenters noted that these restrictions were generally imposed to facilitate the conduct of circle-to-land operations. Due to the ability of helicopters to fly any available instrument approach, regardless of wind direction, and to land at the approach threshold regardless of runway length by pivoting into the wind, if necessary, just before touchdown, the commenters asserted that helicopter operators should not be restricted by these non-standard alternate minimums. They further stated that helicopter operators therefore should be allowed to use lower-than-standard alternate weather minima, regardless of whether standard or nonstandard alternate airport weather minima are specified on part 97 approach plates.

The FAA agrees with these comments. Historically, the FAA has permitted helicopter operators to use procedures different from those permitted to be used by other aircraft. For example, 14 CFR part 97 allows helicopters to utilize "copter procedures" or other procedures prescribed in subpart C of that part, and to use the Category A minimum descent altitude (MDA) or decision height (DH). Part 97 also authorizes helicopter operators to reduce the required visibility minimum to one-half the published visibility minimum for Category A aircraft, but in no case may

it be reduced to less than one-quarter mile or 1,200 feet runway visibility range (RVR).

Alternate airport weather minima are established using the ceiling and visibility requirements for circling approaches as a minimum. ***The United States Standard for Terminal Instrument Procedures (TERPS)*** (FAA Order 8260.3B), Chapter 11. Helicopter Procedures, paragraph 1100.a, "Identification of Inapplicable Criteria," states in part, "circling approach and high altitude penetration criteria do not apply to helicopter procedures." The FAA in fact does not evaluate pilots in the performance of circling approaches during evaluation for any rating or check involving the piloting of a helicopter. Additionally, the Instrument Rating Practical Test Standards (PTS) (FAA-S–8081–4C), published by the FAA to establish the standards for instrument rating certification practical tests for airplane, helicopter, and powered lift category and classes of aircraft indicates that the circling approach task is appropriate only to airplane and airship instrument proficiency checks and ratings.

In the SNPRM, the FAA therefore proposed to change the language of § 91.169 (c)(1)(ii) to permit a helicopter operator to use an airport as an alternate airport provided the ceiling is at least "200 feet above and visibility 1 statute mile above the approach minima for the approach to be flown. * * *" The purpose of this change was to allow helicopters to use lower-than-standard alternate airport minima regardless of the approach to be flown while eliminating the need to alter current approach plates. In making this change, the FAA unintentionally increased the visibility requirements proposed in the original NPRM. To correct this, the FAA has revised the language of § 91.169 (c)(l)(i) in this final rule to correspond with the original intent of the NPRM. See "Discussion of Comments to the SNPRM" below.

Some commenters requested that the FAA specify separate alternate airport weather minima for precision and nonprecision approaches used by a helicopter operator. Specifically, a 400-foot ceiling and one mile visibility was proposed for precision approach procedures and a 600-foot ceiling and one mile visibility was proposed for nonprecision approach procedures. The FAA, however, has not specified separate alternate airport weather minima for precision and nonprecision approaches used by helicopter operators in this rule. This action will ensure that alternate airport approach minima are above actual approach minma in those situations where actual approach minima may be above values commonly associated with precision and nonprecision approaches. The changes recognize the unique operating characteristics of helicopters and remove the operational restrictions that occur by requiring helicopters to use alternate approach minima specified in current instrument approach procedures.

Special Instrument Approach Procedures

Prior to this rule change, § 91.167 (b) stated in part that, "paragraph (a)(2) of this section does not apply if—(1) Part 97 of this chapter prescribes a standard instrument approach procedure for the first airport of intended landing." Additionally, § 91.169 (b) stated in part that "paragraph (a)(2) of this section does not apply if part 97 of this chapter prescribes a standard instrument approach procedure for the first airport of intended landing." That regulatory language did not provide for the use of special instrument approach procedures in determining an aircraft operator's ability to meet alternate airport requirements. This rule will permit an aircraft operator to use an authorized approach procedure in determining compliance with alternate airport requirements.

Special instrument approach procedures are not issued pursuant to part 97 but may be issued to an operator through inclusion in the operator's Operations Specifications or through a letter of authorization issued by the Administrator to a specific operator. These approach procedures are not published in part 97, but are developed under the authority of § 91.175 (a). The FAA has developed over 120 new helicopter non-precision Global Positioning System (GPS) instrument approaches to heliports since 1995, over 75% of them since October 1997. The FAA has determined that these approaches are not standard instrument approach procedures but "special instrument approach procedures" which require additional aircrew training prior to their use. Therefore, to permit aircraft operators to use special instrument approach procedures to comply with alternate airport requirements, the FAA has revised the language contained in § § 91.167 (b)(l) and 91.169 (b)(l), (c)(l), and (c)(2) of the original NPRM to permit the use of these special approaches when issued to an operator by the Administrator.

Weather Reports and Forecasts

Certain commenters noted the FAA's inaccurate use of the terms "weather forecasts" and "weather reports," and the inconsistency between the way the terms "weather reports and forecasts and weather conditions" and "weather reports and/or prevailing weather forecast"' were used in the narrative format and tabular format proposed in § § 91.167 (b) and 91.169 (b) and (c) of the original NPRM. The FAA agrees that the phrases were used inconsistently in the original proposal and is therefore adopting the phrase "appropriate weather reports or weather forecasts, or a combination of them" in those paragraphs that pertain to the selection of an alternate airport. The final rule, however, retains the language proposed in § 91.167 (a) of the original NPRM. This language is substantively identical to that contained in current § 91.167 (a) and ensures consideration of "weather conditions" when determining fuel requirements for civil aircraft operations in IFR conditions, unless the provisions of paragraph (b) apply.

The language used in this final rule reflects current usage of the terms "weather forecasts" and "weather reports" by meteorologists and aviation industry personnel. It also includes the term "appropriate" when referring to weather reports and weather forecasts to indicate that an operator must consider current weather reports and current and valid weather forecasts when determining if a flight requires an alternate airport. Use of the term "appropriate" is consistent with references to weather reports and forecasts in other operating rules. Its inclusion should eliminate any ambiguity and ensure conformity in determining those reports and forecasts that should be considered by an operator when designating an alternate airport. Use of the term "appropriate" is also consistent with the provisions of 14 CFR 91.103 which requires each pilot in command, before beginning a flight, to become familiar with all available information concerning that flight.

With regard to the use of weather forecasts, the FAA notes that although a weather forecast may be valid for a period as long as 24 hours, only the most current and valid weather forecast is considered "appropriate." In some instances a current weather forecast may be issued, however it may not be valid for the time period required to be considered by an operator when choosing an alternate airport. Such a report is not considered "appropriate." Any superceded weather report is not considered current and its use in determining an alternate airport is not considered appropriate.

The rule also does not include the descriptive term "prevailing" with the

phrase "weather forecasts" because "prevailing" is used to refer to actual weather conditions observed at a station and not to weather forecasts. Its use in the context of the original proposal was therefore improper and has been deleted.

Format of the Regulatory Text

In response to the FAA's request in the original NPRM for specific comments on whether readers preferred a tabular or a narrative format in portions of §§ 91.167 (b) and 91.169 (b) and (c), seven commenters addressed the subject. Three commenters preferred the tabular format; two preferred the narrative: and two stated that either format was acceptable. Upon further consideration, the FAA has decided not to use the tables in the form in which they were originally proposed because the format might be confusing to some people. The FAA is currently reviewing part 91 to see how tables and other plain language writing techniques could improve reader comprehension. Until this review is completed, the FAA has decided to use the narrative format for §§ 91.167 (b) and 91.169 (b) and (c), but might reconsider this decision in future rulemaking.

Technical Corrections

In the original NPRM, the FAA proposed distinct alternate airport weather minima for airplanes and helicopters. Aircraft other than airplanes and helicopters (e.g. airships) however may require access to the IFR system and require the need for an alternate airport. The FAA has therefore revised the language in the original proposal to provide different alternate airport requirements for helicopters and for aircraft other than helicopters, as opposed to airplanes, in this final rule.

Discussion of Comments to the SNPRM

The public comment period on the FAA's SNPRM closed on August 2, 1999. Six comments were received, all of which were generally favorable. Five commenters pointed out that the FAA changed the visibility minimum in § 91.169 (c)(1)(ii) when it sought to revise helicopter alternate airport weather minima by eliminating the distinction between precision and nonprecision approaches specified in the original NPRM. The original NPRM had stated the visibility for both types of approaches "will be 1 statute mile. but never lower than the published minima for the approach to be flown." However, the commenters stated, since visibility required for a typical helicopter ILS approach is ¼ mile, that would require an airport with this type of approach to have a visibility of at least 1¼ miles to be considered an acceptable alternate airport. The original NPRM, however, would have permitted the designation of an airport that is forecast to have 1 mile visibility as an alternate airport on a helicopter instrument flight plan. The FAA agrees with the commenters and has changed the language in that section accordingly. One of the commenters also stated that if an aircraft is equipped with the appropriate advanced equipment that enhances situational awareness and reduces pilot workload, the aircraft should be eligible for alternate minima that are lower than those the FAA proposed. The FAA believes the comment is outside the scope of this rulemaking action and, therefore, is adopting the alternate minima set forth in this final rule.

Technical Corrections

For the reasons previously specified in the discussion of "Weather Reports and Forecasts" under "Discussion of Comments to the Original NPRM," the final rule retains the language originally proposed in § 91.167 (a). This language is substantively identical to the language in current § 91.167 (a).

In addition, in § 91.169 (c)(2), the word "or" has been changed to "and." This change was made because the intent of the proposal was only to require the more restrictive VFR ceiling and visibility minima for the alternate airport if no instrument approach procedure had been published or issued.

Discussion of Dates

The Administrative Procedures Act (APA) (5 U.S.C. 553 (d)) requires publication of an amendment in the **Federal Register** at least 30 days before the effective date, unless good cause is determined. Because this final rule will increase safety by enabling more helicopter pilots to operate under IFR in marginal weather conditions without the restrictions imposed by the current regulations, the FAA has determined that there is no reason to delay the effective date for 30 days. The rule is therefore effective upon publication in the **Federal Register.**

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has determined that there are no new requirements for information collection associated with this final rule.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and intends to file the following differences.

This rule does not prescribe that the weather at the airport of intended landing be at or above the operating minima at the estimated time of arrival. Paragraph 2.6.2.1 of ICAO annex 6, Part III, International Operations—Helicopters, Section III, International General Aviation, Chapter 2, Flight Operations, requires that the heliport of intended landing meet operating minima at the estimated time of arrival.

This rule would require helicopter operators to evaluate weather conditions at the airport of intended landing from the estimated time of arrival until one hour after the estimated time of arrival when determining whether an alternate airport is required. Paragraph 2.6.2.2 of ICAO Annex 6, Part III, Section III requires an operator to evaluate weather conditions at the heliport of intended landing from two hours before to two hours after the estimated time of arrival or from the actual time of departure to two hours after the estimated time of arrival or from the actual time of departure to two hours after the estimated time of arrival.

Paragraph 2.7.1 of ICAO Annex 6, Part III, Section III states that an alternate shall be required in an operator's flight plan unless the weather conditions specified in paragraph 2.6.2.2 of that section prevail or other specific conditions related to isolated heliports are met and a point of no return (PNR) determination is made, if applicable. The weather conditions for the selection of an alternate differ from those specified in paragraph 2.6.2.2, and the rule does not address isolated heliports and PNR determinations.

The FAA has not adopted the ICAO standards for the reasons discussed earlier in this preamble.

Regulatory Evaluation Summary

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the

economic effect of regulatory changes on small entities. Third, OMB directs agencies to assess the effect of regulatory changes on international trade. And fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation).

In conducting these analyses, the FAA has determined that this rule is not "a significant regulatory action" under section 3(f) of Executive Order 12866 and, therefore, is not subject to review by the Office of Management and Budget. The rule is not considered significant under the regulatory policies and procedures of the Department of Transportation (44 FR 11034; February 26, 1979). This rule will not have a significant impact on a substantial number of small entities and will not constitute a barrier to international trade. This rule will not impose any additional equipment, training, or other cost to the aviation industry. Therefore, there will be no compliance costs associated with the rule. The FAA estimates that the rule will provide $58 million ($41 million, present value) in benefits over the next 10 years. In addition, there will be the non-quantified benefits which include a reduction in the level of aircraft noise experienced by individuals on the ground when helicopters fly at higher altitudes and possible savings in corporate personnel time associated with enhanced corporate flight operations.

The rule will not present a significant impediment to either U.S. firms doing business abroad, or foreign firms doing business in the United States. Furthermore, the FAA certifies that the rule will not have a significant economic impact on a substantial number of small entities. The rule does not contain any Federal intergovernmental or private sector mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980, 5 U.S.C. 601–612, was enacted by the U.S. Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a regulatory flexibility analysis if a rule has a significant economic impact on a substantial number of small business entities. FAA's interim regulatory flexibility policy and guidelines establish threshold costs and small entity size standards for complying with RFA requirements. This guidance defines small entities in terms of size thresholds, significant economic impact in terms of annualized cost thresholds, and substantial number as a number which is not less than eleven and which is more than one-third of the small entities subject to the final rule.

This rule will impact entities regulated by part 91. The FAA has determined that there are no compliance costs associated with this rule. The FAA has also solicited comments during this rulemaking. No operators responded that they felt they would be negatively impacted from implementation of the rule. Only positive comments were received supporting the FAA's position that this rulemaking will not place any additional requirements on the aviation industry. Therefore, the FAA believes that there are no compliance costs associated with the rule. Accordingly, pursuant to the Regulatory Flexibility Act of 1980 (5 U.S.C. 605 (b)), the FAA certifies that this rule will not have a significant impact on a substantial number of small entities.

International Trade Impact Statement

The provisions of this rule will have little or no impact on trade for U.S. firms doing business in foreign countries and foreign firms doing business in the United States.

Federalism Implications

The FAA has analyzed this rule under the principles and criteria of Executive Order 13132, Federalism. The FAA has determined that this action will 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, the FAA has determined that this final rule does not have federalism implications.

Unfunded Mandates Reform Act Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), codified in 2 U.S.C. 1501–1571, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that will impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain any Federal intergovernmental or private sector mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment or environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this rulemaking action qualifies for a categorical exclusion.

Energy Impact

The energy impact of the notice has been assessed in accordance with the Energy Policy and Conservation Act (EPCA), Pub. L. 94–163, as amended (43 U.S.C. 6362) and FAA Order 1053.1. It has been determined that the final rule is not a major regulatory action under the provisions of the EPCA.

List of Subjects

14 CFR Part 21

Aircraft, Aviation safety, Exports, Imports, Reporting and recordkeeping requirements.

14 CFR Part 27

Aircraft, Aviation safety.

14 CFR Part 29

Aircraft, Aviation safety.

14 CFR Part 91

Aircraft, Airports, Aviation safety.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends parts 21, 27, 29, and 91 of Chapter I, title 14, Code of Federal Regulations, as follows:

PART 21—CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS

1. The authority citation for part 21 continues to read as follows:

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(g), 40105, 40113, 44701–44702, 44707, 44709, 44711, 44713, 44715, 45303.

SFAR No. 29–4 [Removed]

2. Remove Special Federal Aviation Regulation (SFAR) No. 29–4—Limited IFR Operations of Rotorcraft from part 21.

PART 27—AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT

3. The authority citation for part 27 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44704.

SFAR No. 29–4 [Removed]

4. Remove SFAR No. 29–4 from in part 27.

PART 29—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

5. The authority citation for part 29 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44704.

SFAR No. 29–4 [Removed]

6. Remove SFAR No. 29–4 from in part 29.

PART 91—GENERAL OPERATING AND FLIGHT RULES

7. The authority citation for part 91 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1155, 40103, 40113, 40120, 44101, 44111, 44701, 44709, 44711, 44712, 44715, 44716, 44717, 44722, 46306, 46315, 46316, 46504, 46506–46507, 47122, 47508, 47528–47531, articles 12 and 29 of the Convention on International Civil Aviation (61 stat. 1180).

SFAR No. 29–4 [Removed]

8. Remove Special Federal Aviation Regulation (SFAR) No. 29–4, Limited IFR Operations of Rotorcraft, from part 91.

9. Revise § 91.167 to read as follows:

§ 91.167 Fuel requirements for flight in IFR conditions.

(a) No person may operate a civil aircraft in IFR conditions unless it carries enough fuel (considering weather reports and forecasts and weather conditions) to-

(1) Complete the flight to the first airport of intended landing;

(2) Except as provided in paragraph (b) of this section, fly from that airport to the alternate airport; and

(3) Fly after that for 45 minutes at normal cruising speed or, for helicopters, fly after that for 30 minutes at normal cruising speed.

(b) Paragraph (a)(2) of this section does not apply if:

(1) Part 97 of this chapter prescribes a standard instrument approach procedure to, or a special instrument approach procedure has been issued by the Administrator to the operator for, the first airport of intended landing; and

(2) Appropriate weather reports or weather forecasts, or a combination of them, indicate the following:

(i) *For aircraft other than helicopters.* For at least 1 hour before and for 1 hour after the estimated time of arrival, the ceiling will be at least 2,000 feet above the airport elevation and the visibility will be at least 3 statute miles.

(ii) *For helicopters.* At the estimated time of arrival and for 1 hour after the estimated time of arrival, the ceiling will be at least 1,000 feet above the airport elevation, or at least 400 feet above the lowest applicable approach minima, whichever is higher, and the visibility will be at least 2 statute miles.

10. Revise § 91.169 (a), (b), and (c) to read as follows:

§ 91.169 IFR flight plan: Information required.

(a) *Information required.* Unless otherwise authorized by ATC, each person filing an IFR flight plan must include in it the following information:

(1) information required under § 91.153 (a) of this part:

(2) Except as provided in paragraph (b) of this section, an alternate airport.

(b) Paragraph (a)(2) of this section does not apply if :

(1) Part 97 of this chapter prescribes a standard instrument approach procedure to, or a special instrument approach procedure has been issued by the Administrator to the operator for, the first airport of intended landing; and

(2) Appropriate weather reports or weather forecasts, or a combination of them, indicate the following:

(i) *For aircraft other than helicopters.* For at least 1 hour before and for 1 hour after the estimated time of arrival, the ceiling will be at least 2,000 feet above the airport elevation and the visibility will be at least 3 statute miles.

(ii) For helicopters. At the estimated time of arrival and for 1 hour after the estimated time of arrival, the ceiling will be at least 1,000 feet above the airport elevation, or at least 400 feet above the lowest applicable approach minima, whichever is higher, and the visibility will be at least 2 statute miles.

(c) *IFR alternate airport weather minima.* Unless otherwise authorized by the Administrator, no person may include an alternate airport in an IFR flight plan unless appropriate weather reports or weather forecasts, or a combination of them, indicate that, at the estimated time of arrival at the alternate airport, the ceiling and visibility at that airport will be at or above the following weather minima:

(1) If an instrument approach procedure has been published in part 97 of this chapter, or a special instrument approach procedure has been issued by the Administrator to the operator, for that airport, the following minima:

(i) *For aircraft other than helicopters:* The alternate airport minima specified in that procedure, or if none are specified the following standard approach minima:

(A) *For a precision approach procedure.* Ceiling 600 feet and visibility 2 statute miles.

(B) *For a nonprecision approach procedure.* Ceiling 800 feet and visibility 2 statute miles.

(ii) *For helicopters:* Ceiling 200 feet above the minimum for the approach to be flown, and visibility at least 1 statute mile but never less than the minimum visibility for the approach to be flown, and

(2) If no instrument approach procedure has been published in part 97 of this chapter and no special instrument approach procedure has been issued by the Administrator to the operator, for the alternate airport, the ceiling and visibility minima are those allowing descent from the MEA, approach, and landing under basic VFR.

* * * * *

Issued in Washington, DC, on January 13, 2000.

Jane F. Garvey,

Administrator.

[FR Doc. 00–1326 Filed 1–20–00; 8:45 am)

BILLING CODE 4910–13–U

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration.

14 CFR Parts 21, 27, 29, and 91

[Docket No. FAA-98-4390; Amendment No. 21-76, 27-39, 29-46, 91-259]

RIN 2120—AG53

Flight Plan Requirements for Helicopter Operations Under Instrument Flight Rules

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is amending instrument flight rules (IFR) for helicopters by revising alternate airport weather planning requirements, weather minima necessary to designate an airport as an alternate on an IFR flight plan, and fuel requirements for helicopter flight into IFR conditions. This action will provide operators with an additional margin of safety by easing access of helicopters to the IFR system. result in a reduction of noise heard on the ground. and increase the ability of operators to use helicopters more efficiently.

EFFECTIVE DATE: [Insert date of publication in the Federal Register.]

FOR FURTHER INFORMATION CONTACT: William H. Wallace, General Aviation Commercial Division (AFS-804), Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone (202) 267-3771.

Filed on Jan. 20, 2000
Published on Jan. 21, 2000
Separate part II

SUPPLEMENTARY INFORMATION:

Availability of Final Rules

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the FedWorld electronic bulletin board service (telephone: (703) 321-3339) or the Government Printing Office's (GPO) electronic bulletin board service (telephone: (202) 5 12-1661).

Internet users may reach the FAA's web page at http://www.faa.gov/avr/arm/nprm/nprm.htm or the GPO's web page at http://www.access.gpo.gov/nara for access to recently published rulemaking documents.

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM- 1, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267-9680. Communications must identify the amendment number or docket number of this final rule.

Persons interested in being placed on the mailing list for future rulemaking documents should request from the above office a copy of Advisory Circular No. 1 1-2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires the FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. Therefore, any small entity that has a question regarding this document may contact their local FAA official.

Internet users can find additional information on SBREFA on the FAA's web page at http://www.faa.gov/avr/arm/sbrefa/htm and may send electronic inquiries to the following internet address: 9-AWA-SBREFA@faa.gov.

Background

The FAA issued a Notice of Proposed Rulemaking (NPRM) (63 FR 46834; Sept. 2, 1998) that proposed to amend the general operating rules for helicopters by revising alternate airport weather planning requirements, weather minima necessary to designate an airport as an alternate on an IFR flight plan, and the fuel requirements for helicopter flight into IFR flight conditions. The NPRM also proposed to withdraw Special Federal Aviation Regulation (SFAR) No. 29-4, Limited IFR Operations of Rotorcraft. The public comment period closed on October 2, 1998.

The FAA later issued a Supplemental Notice of Proposed Rulemaking (SNPRM) (64 FR 35902; July 1, 1999) that sought comments on modifications made to the NPRM in response to commenters' suggestions. The public comment period for the SNPRM closed on August 2, 1999.

Statement of the Problem

Flight planning requirements (including alternate airport weather minima) for helicopters and other aircraft are virtually identical, even though their operating characteristics are substantially different. The only distinction between the flight planning requirements for helicopters and other aircraft is addressed in 14 CFR 91.167, which specifies different requirements for the amount of fuel helicopters and other

aircraft must carry after completing a flight to the first airport of intended landing. Helicopters, however, fly shorter distances at slower airspeeds than most other aircraft, and they generally remain in the air for shorter periods between landings. A helicopter is therefore less likely to fly into unanticipated, unknown, or unforecast weather. The relatively short duration of the typical helicopter flight means that the departure weather and the destination weather are likely to be within the same weather system. This final rule revises the flight planning requirements for helicopter IFR operations to take into account their unique operating characteristics.

History

Over the past several years, there have been specific recommendations from industry, and from joint efforts of the FAA and industry regarding regulatory changes to safely expand helicopter access to the IFR system. The FAA has been addressing these recommendations by working with industry to identify regulations that prevent safe helicopter operations in the IFR environment.

Previous Rulemakings In January 1975, the FAA issued Special Federal Aviation Regulation (SFAR) No. 29 (40 FR 2420; Jan. 13, 1975), which authorized the carriage, in rotorcraft IFR operations, of less than the 45 minutes, but not less than the 30 minutes, of additional fuel reserve, then required by §91.23(c) (now §91.167(a)(3)), when approved by the Administrator. The SFAR also authorized the issuance of approvals for limited IFR operations for certain transport category rotorcraft that are certified to only operate under VFR. In 1979, the FAA undertook the Rotorcraft Regulatory Review Program (44

FR 3250; Jan. 15, 1979), which was a comprehensive review of rotorcraft operations and certification.

In an NPRM issued in 1985 (50 FR 10144; March 13, 1985), the FAA proposed to amend §91.23 (now §91.167) by reducing the fuel reserve requirement for helicopters from 45 minutes to 30 minutes. The FAA also proposed to amend the alternate airport IFR flight plan filing requirements by reducing the ceiling minimum for helicopters from 2,000 feet to 1,000 feet, and the visibility minimum for helicopters from 3 miles to 1 mile. No changes were proposed to §91.83 (now §91.169). As the FAA stated in the preamble to the 1985 NPRM, the basis for the proposed reductions was that a helicopter has the unique ability to reduce airspeed safely on approach to as low as 40 knots, and is therefore provided reduced visibility minima in part 97. The proposal also said that because the helicopter, with its reduced minima, has a better probability of completing the flight to the planned destination, it should be allowed a reduced fuel reserve. In the 1985 NPRM, the FAA also stated that it had gained sufficient experience with operations under SFAR No. 29 to conclude that reducing the required fuel reserve would not decrease the level of safety.

In 1986, the FAA issued a final rule (51 FR 40692; Nov. 7, 1986) that adopted the proposal to reduce the fuel reserve required under §91.23. The FAA did not, however, adopt the proposal to reduce the ceiling and visibility minima because a report entitled "Weather Deterioration Models Applied to Alternate Airport Criteria (Report No. DOT/FAA/RD 81/92 (September 1981) had stated that "any reduction in alternate airport requirements should be offset by limiting the duration of the flight for which the reduced requirements apply" (p. 4-1). The findings in that report, however, were preliminary, and

in the years that have passed since it was issued, the FAA's experience with helicopter IFR flight plan filing criteria indicates that the preliminary concern for reduced helicopter ceiling and visibility minima was overemphasized.

U.S. *Army Practices* In 1982, the U.S. Army adopted reduced IFR alternate airport weather planning minima and alternate airport selection criteria for both helicopters and airplanes. The Army's criteria of a ceiling 400 feet above the weather planning minimum required for the approach to be flown, and visibility one mile greater than the weather planning minimum required for the approach to be flown has been used for over 17 years and there have been thousands of flight hours with no mishaps associated with these weather planning criteria. The U.S. Army's experience demonstrates that reducing helicopter ceiling and visibility minima for IFR flight planning results in a level of safety equivalent to the current rule and offers greater operational flexibility for helicopter operators.

ELVIRA Workshop In August 1993, a workshop conducted by the FAA with industry, called the Extremely Low Visibility Instrument Rotorcraft Approaches (ELVIRA) Workshop, resulted in a list of "Ten Most Wanted" changes (see "Extremely Low Visibility IFR Rotorcraft Approach (ELVIRA) Operational Concept Development, Final Report," Report No. DOT/FAA/RD-94/ 1 ,I. (March 1994)). The unprioritized list of 10 desired IFR system enhancements included "rotorcraft specific minima" for determining the need for, and availability of, alternate airports for flight plan filing purposes (ELVIRA final report, p. 3).

Since rotorcraft are for the most part range-limited, their destination airport and alternate airport will most likely be in the same air mass and consequently will have

similar weather. In the ELVIRA final report (p. 34), the FAA noted that the current regulations result in a "severe penalty in the productivity of helicopters operating under IFR." In addition, the FAA observed that "with certain weather conditions it is often impossible for the helicopter operator to gain access to the current IFR system, while VFR flight is allowed. . . . [C]hanging this [the alternate airport minima] to 400- 1 for a [helicopter] precision approach and 600-1 for a [helicopter] non-precision approach procedure, will enable many more [helicopter] IFR operations to take place while maintaining the same level of safety" (pp. 34-35).

Petitions for Exemption On February 23, 1995, Helicopter Association International (HAI) petitioned the FAA for an exemption from §91.169 (c)(l)(i), which provides that alternate airport minima for a precision approach are a ceiling of 600 feet and visibility of 2 statute miles. The petition asked the FAA to allow lower alternate airport weather minima for IFR flight planning.

On April 24, 1996, HAI filed an amendment to its petition for exemption from §91.169 (c)(l)(i), proposing, in part, to limit operations under the requested exemption to those conducted by certain operators named in the amended petition. The stated purpose of this amendment was the further "accumulation of data to prove the operational safety of the use of such minimums." In addition, the FAA has received 13 other petitions requesting amendments to §§91.169 and 9 1.167 to allow helicopter operations with reduced alternate weather requirements. (With the issuance of the NPRM published on September 2, 1998, the FAA closed the docket on HAI's petition for exemption, and on the petitions submitted by HAI and others for various amendments to §§91.169, 9 1.167 and related regulations.)

ARAC Actions The Aviation Rulemaking Advisory Committee (ARAC) was established by the FAA to provide industry information and expertise during the rulemaking process. In October 1991, an IFR Fuel Reserve Working Group of the ARAC, General Aviation Operations Issues, was assigned the task to "evaluate the advantages and disadvantages of revising the fuel reserve requirements for flight under instrument flight rules" (56 FR 5 1744; Oct. 15, 1991). Later the working group also evaluated: (1) the advantages and disadvantages of revised precision and non-precision instrument approach minima and alternate weather minima, considering the operational capability of the helicopter to decelerate before and during arrival at the Decision Height or Minimum Descent Altitude, including circling approaches; and (2) whether or not this capability reduces risk and the probability of a missed approach and the need to proceed to an alternate and meet the resulting regulatory alternate fuel requirement. The working group, which consisted of representatives from helicopter associations, helicopter manufacturers, helicopter pilot associations, helicopter operators, and government agencies, met numerous times between January 1992 and October 1997. As a result, ARAC submitted its recommendation to the FAA in November 1997. The FAA based the NPRM, published on September 2, 1998, and the SNPRM, published on July 1, 1999, on that ARAC recommendation.

ARAC recommended that the FAA revise the weather minima used to determine whether carriage of additional fuel to reach an alternate airport is needed when flying in IFR conditions. Specifically, ARAC suggested revising paragraph (b)(2) of §91.167--*Fuel requirements for flight in IFR conditions,* to state that: "... weather reports or prevailing weather forecast or combination of them indicate.. . for helicopters, at the

estimated time of arrival, the ceiling will be 1,000 feet above the airport elevation or 400 feet above the lowest approach minima, whichever is higher; and.. .at the estimated time of arrival, the visibility will be at least 2 statute miles." The ARAC's suggested revisions would create different ceiling and visibility criteria for helicopters (as opposed to those for other aircraft), and would also change the requirement that those ceiling and visibility criteria be in effect for at least 1 hour before and 1 hour after the estimated time of arrival.

ARAC also recommended that IFR flight plan requirements for helicopters be amended by revising the alternate airport weather planning requirements and weather minima necessary when designating an alternate airport on an IFR flight plan. ARAC suggested that the FAA revise paragraph (b) of §91.169—*IFR flight plan: Information required,* to state that the provision,; of paragraph (a)(2) of that section would not apply if 14 CFR part 97 prescribes "... a standard instrument approach procedure for the first airport of intended landing and the weather reports or prevailing weather forecast or combination of them indicate.. . for helicopters, at the estimated time of arrival, the ceiling will be at least 1,000 feet above the airport or heliport elevation or 400 feet above the lowest approach minima, whichever is higher; and.. .at the estimated time of arrival. the visibility will be at least 2 statute miles."

Under §91.169 (c), ARAC again suggested creating IFR alternate weather minima for helicopters performing precision and nonprecision approaches that would be different from those applicable to other aircraft. The new criteria would apply when it would be necessary to include an alternate airport in an IFR flight plan. Ceiling and visibility conditions at the alternate airport would be for "current prevailing weather

forecasts.. .at the estimated time of arrival" (when no instrument approach procedure has been specified in 14 CFR part 97 for an alternate airport). The helicopter minima recommended by ARAC were as follows: For a "precision approach procedure.. .for helicopters, [c]eiling 400 feet and visibility 1 statute mile;" and for a "nonprecision approach procedure . . .for helicopters, [c]eiling 600 feet and visibility 1 statute mile."

The FAA agreed with most of ARAC's recommendations, except the elimination of the requirement under §§91.167 (b)(2) and 9 1.169 (b) that weather report and forecast data be in effect for 1 hour after the estimated time of arrival.

Discussion of Comments to the Original NPRM

General

The public comment period on the FAA's September 2, 1998 NPRM closed on October 2, 1998. Thirty-nine comments were received, all of which were generally supportive of the proposal. Commenters praised the NPRM for its potential to enhance safety by facilitating the expansion of helicopter operations under IFR in marginal weather conditions, thereby reducing weather-related accidents. Commenters also stated that adoption of the rule would enable operators to better utilize their IFR-equipped helicopters, transport clients more efficiently, and reduce noise on the ground. Seven commenters however stated that certain technical issues were not adequately addressed by the FAA in the proposal. These concerns are addressed in detail in the following discussion. In addition, since the FAA's economic analysis did not anticipate any cost of compliance or need for additional equipment or training, comments on both the quantitative and qualitative benefits of the proposal were favorable also.

Removal of SFAR No. 29-4

A number of commenters addressed the proposed removal of SFAR No. 29-4, Limited IFR Operations of Rotorcraft. One commenter stated that in the past, his company used the provisions of the SFAR to "prove IFR capabilities in a then non-IFR certified helicopter," and the company "does not want to lose this capability." Two other commenters stated that the FAA should retain the provisions of the SFAR for a period of time (for either a year or a "reasonable time") after the other provisions of the NPRM are implemented as a final rule. The commenters believed that this course of action would have enabled the FAA and industry to determine whether the SFAR was needed or had outlived its usefulness. After that time, the FAA could better evaluate its removal. The FAA does not believe retaining the SFAR is necessary and is therefore removing it.

The SFAR was originally adopted to permit the FAA to collect operational data to study the feasibility of limited rotorcraft operations in IFR conditions. Since the adoption of the SFAR, the FAA has addressed the issue of helicopter IFR operations and issued regulations that govern both the certification and operation of helicopters under IFR. These regulations are found in Appendix B—Airworthiness Criteria for Helicopter Instrument Flight, contained in both 14 CFR parts 27 and 29. Operational regulations permitting helicopters to engage in IFR operations are found in 14 CFR parts 91 and 135.

Paragraph 5 of SFAR 29-4 states that "new applications for limited IFR rotorcraft operations under SFAR No. 29 may be submitted for approval until, but not including the effective date of Amendment No. 1 of the Rotorcraft Regulatory Review Program. On and after the effective date of Amendment No. 1, all applicants for certification of IFR rotorcraft operations must comply with the applicable provisions of the Federal Aviation

Regulations." The effective date of Amendment No. 1 was March 2, 1983. Concurrent with the effective date of Amendment No. 1, regulations establishing airworthiness criteria for helicopter instrument flight became effective. All new applicants for certification of helicopter IFR operations must now comply with the provisions of Appendix B of parts 27 or 29, as applicable, and part 91. Because the FAA has established certification criteria and operational limitations for helicopters engaged in IFR operations, the need to prove IFR capabilities in a non-IFR certified helicopter is no longer warranted. The changes made to the regulations since the promulgation of SFAR No. 29 therefore no longer make its provisions necessary.

Alternate Airport Weather Minima

Commenters stated that the NPRM did not provide alternate airport weather minima reductions for helicopters' when airports that have non-standard alternate airport weather minima are used as alternate airports. Prior to the adoption of this rule, standard alternate airport weather minima for all aircraft were stated in 14 CFR 91.169 (c)(l)(i) and (ii), (i.e., for a precision approach procedure a ceiling of 600 feet and a visibility of 2 statute miles; for a nonprecision approach procedure, a ceiling of 800 feet and a visibility of 2 statute miles).

The commenters stated that helicopter operators should not be subject to the same restrictions imposed on operators of other types of aircraft by the use of nonstandard alternate minimums. The commenters noted that these restrictions were generally imposed to facilitate the conduct of circle-to-land operations. Due to the ability of helicopters to fly any available instrument approach, regardless of wind direction, and to

land at the approach threshold regardless of runway length by pivoting into the wind, if necessary, just before touchdown, the commenters asserted that helicopter operators should not be restricted by these non-standard alternate minimums. They further stated that helicopter operators therefore should be allowed to use lower-than-standard alternate weather minima, regardless of whether standard or nonstandard alternate airport weather minima are specified on part 97 approach plates.

The FAA agrees with these comments. Historically, the FAA has permitted helicopter operators to use procedures different from those permitted to be used by other aircraft. For example, 14 CFR part 97 allows helicopters to utilize "copter procedures" or other procedures prescribed in subpart C of that part, and to use the Category A minimum descent altitude (MDA) or decision height (DH). Part 97 also authorizes helicopter operators to reduce the required visibility minimum to one-half the published visibility minimum for Category A aircraft;' but in no case may it be reduced to less than one-quarter mile or 1,200 feet runway visibility range (RVR).

Alternate airport weather minima are established using the ceiling and visibility requirements for circling approaches as a minimum. The United States Standard for Terminal Instrument Procedures (TERPS) (FAA Order 8260.3B), Chapter 11. Helicopter Procedures, paragraph 1100.a, "Identification of Inapplicable Criteria:" states in part, "circling approach and high altitude penetration criteria do not apply to helicopter procedures." The FAA in fact does not evaluate pilots in the performance of circling approaches during evaluation for any rating or check involving the piloting of a helicopter. Additionally, the Instrument Rating Practical Test Standards (PTS)

(FAA-S-8081-4C), published by the FAA to establish the standards for instrument rating certification practical tests for airplane, helicopter, and powered lift category and classes of aircraft indicates that the circling approach task is appropriate only to airplane and airship instrument proficiency checks and ratings.

In the SNPRM, the FAA therefore proposed to change the language of § 91.169 (c)(1)(ii) to permit a helicopter operator to use an airport as an alternate airport provided the ceiling is at least "200 feet above and visibility 1 statute mile above the approach minima for the approach to be flown.. . ." The purpose of this change was to allow helicopters to use lower-than-standard alternate airport minima regardless of the approach to be flown while eliminating the need to alter current approach plates. In making this change, the FAA unintentionally increased the visibility requirements proposed in the original NPRM. To correct this, the FAA has revised the language of §91.169 (c)(l)(i) in this final rule to correspond with the original intent of the NPRM. See "Discussion of Comments to the SNPRM" below.

Some commenters requested that the FAA specify separate alternate airport weather minima for precision and nonprecision approaches used by a helicopter operator. Specifically, a 400-foot ceiling and one mile visibility was proposed for precision approach procedures and a 600-foot ceiling and one mile visibility was proposed for nonprecision approach procedures. The FAA, however, has not specified separate alternate airport weather minima for precision and nonprecision approaches used by helicopter operators in this rule. This action will ensure that alternate airport approach minima are above actual approach minma in those situations where actual approach minima may be above values commonly associated with precision and nonprecision

approaches. The changes recognize the unique operating characteristics of helicopters and remove the operational restrictions that occur by requiring helicopters to use alternate approach minima specified in current instrument approach procedures.

Special Instrument Approach Procedures

Prior to this rule change, §91.167 (b) stated in part that, "paragraph (a)(2) of this section does not apply if – (1) Part 97 of this chapter prescribes a standard instrument approach procedure for the first airport of intended landing." Additionally, §91.169 (b) stated in part that "paragraph (a)(2) of this section does not apply if part 97 of this chapter prescribes a standard instrument approach procedure for the first airport of intended landing." That regulatory language did not provide for the use of special instrument approach procedures in determining an aircraft operator's ability to meet alternate airport requirements. This rule will permit an aircraft operator to use an authorized approach procedure in determining compliance with alternate airport requirements.

Special instrument approach procedures are not issued pursuant to part 97 but may be issued to an operator through inclusion in the operator's Operations Specifications or through a letter of authorization issued by the Administrator to a specific operator. These approach procedures are not published in part 97, but are developed under the authority of §91.175 (a). The FAA has developed over 120 new helicopter non-precision Global Positioning System (GPS) instrument approaches to heliports since 1995, over 75% of them since October 1997. The FAA has determined that these approaches are not standard instrument approach procedures but "special instrument approach procedures" which require additional aircrew training prior to their

use. Therefore, to permit aircraft operators to use special instrument approach procedures to comply with alternate airport requirements, the FAA has revised the language contained in §§ 91.167 (b)(1) and 91.169 (b)(1), (c)(1), and (c)(2) of the original NPRM to permit the use of these special approaches when issued to an operator by the Administrator.

Weather Reports and Forecasts

Certain commenters noted the FAA's inaccurate use of the terms "weather forecasts" and "weather reports," and the inconsistency between the way the terms "weather reports and forecasts and weather conditions" and "weather reports and/or prevailing weather forecast"' were used in the narrative format and tabular format proposed in §§91.167 (b) and 91.169 (b) and (c) of the original NPRM. The FAA agrees that the phrases were used inconsistently in the original proposal and is therefore adopting the phrase "appropriate weather reports or weather forecasts, or a combination of them" in those paragraphs that pertain to the selection of an alternate airport. The final rule, however, retains the language proposed in §91.167 (a) of the original NPRM. This language is substantively identical to that contained in current §91.167 (a) and ensures consideration of "weather conditions" when determining fuel requirements for civil aircraft operations in IFR conditions, unless the provisions of paragraph (b) apply.

The language used in this final rule reflects current usage of the terms "weather forecasts" and "weather reports" by meteorologists and aviation industry personnel. It also includes the term "appropriate" when referring to weather reports and weather forecasts to indicate that an operator must consider current weather reports and current

and valid weather forecasts when determining if a flight requires an alternate airport. Use of the term "appropriate" is consistent with references to weather reports and forecasts in other operating rules. Its inclusion should eliminate any ambiguity and ensure conformity in determining those reports and forecasts that should be considered by an operator when designating an alternate airport. Use of the term "appropriate" is also consistent with the provisions of 14 CFR 91.103 which requires each pilot in command, before beginning a flight, to become familiar with all available information concerning that flight.

With regard to the use of weather forecasts, the FAA notes that although a weather forecast may be valid for a period as long as 24 hours, only the most current and valid weather forecast is considered "appropriate." In some instances a current weather forecast may be issued, however it may not be valid for the time period required to be considered by an operator when choosing an alternate airport. Such a report is not considered "appropriate." Any superceded weather report is not considered current and its use in determining an alternate airport is not considered appropriate.

The rule also does not include the descriptive term "prevailing" with the phrase "weather forecasts" because "prevailing" is used to refer to actual weather conditions observed at a station and not to weather forecasts. Its use in the context of the original proposal was therefore improper and has been deleted.

Format of the Regulatory Text

In response to the FAA's request in the original NPRM for specific comments on whether readers preferred a tabular or a narrative format in portions of §§ 91.167(b) and

91.169 (b) and (c), seven commenters addressed the subject. Three commenters preferred the tabular format; two preferred the narrative; and two stated that either format was acceptable. Upon further consideration, the FAA has decided not to use the tables in the form in which they were originally proposed because the format might be confusing to some people. The FAA is currently reviewing part 91 to see how tables and other plain language writing techniques could improve reader comprehension. Until this review is completed, the FAA has decided to use the narrative format for §§91.167 (b) and 91.169 (b) and (c), but might reconsider this decision in future rulemaking.

Technical Corrections

In the original NPRM, the FAA proposed distinct alternate airport weather minima for airplanes and helicopters. Aircraft other than airplanes and helicopters (e.g. airships) however may require access to the IFR system and require the need for an alternate airport. The FAA has therefore revised the language in the original proposal to provide different alternate airport requirements for helicopters and for aircraft other than helicopters, as opposed to airplanes, in this final rule.

Discussion of Comments to the SNPRM

The public comment period on the FAA's SNPRM closed on August 2, 1999. Six comments were received, all of which were generally favorable. Five commenters pointed out that the FAA changed the visibility minimum in §91.169 (c)(1)(ii) when it sought to revise helicopter alternate airport weather minima by eliminating the distinction between precision and nonprecision approaches specified in the original NPRM. The original NPRM had stated the visibility for both types of approaches "will be 1 statute

mile, but never lower than the published minima for the approach to be flown." However, the commenters stated, since visibility required for a typical helicopter ILS approach is ¼ mile, that would require an airport with this type of approach to have a visibility of at least 1 ¼ miles to be considered an acceptable alternate airport. The original NPRM, however, would have permitted the designation of an airport that is forecast to have 1 mile visibility as an alternate airport on a helicopter instrument flight plan. The FAA agrees with the commenters and has changed the language in that section accordingly. One of the commenters also stated that if an aircraft is equipped with the appropriate advanced equipment that enhances situational awareness and reduces pilot workload, the aircraft should be eligible for alternate minima that are lower than those the FAA proposed. The FAA believes the comment is outside the scope of this rulemaking action and, therefore, is adopting the alternate minima set forth in this final rule.

Technical Corrections

For the reasons previously specified in the discussion of "Weather Reports and Forecasts" under "Discussion of Comments to the Original NPRM," the final rule retains the language originally proposed in §91.167 (a). This language is substantively identical to the language in current §91.167 (a).

In addition, in §91.169 (c)(2), the word "or" has been changed to "and." This change was made because the intent of the proposal was only to require the more restrictive VFR ceiling and visibility minima for the alternate airport if no instrument approach procedure had been published or issued.

Discussion of Dates

The Administrative Procedures Act (APA) (5 U.S.C. 553 (d)) requires publication of an amendment in the Federal Register at least 30 days before the effective date, unless good cause is determined. Because this final rule will increase safety by enabling more helicopter pilots to operate under IFR in marginal weather conditions without the restrictions imposed by the current regulations, the FAA has determined that there is no reason to delay the effective date for 30 days. The rule is therefore effective upon publication in the Federal Register.

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has determined that there are no new requirements for information collection associated with this final rule.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and intends to file the following differences.

This rule does not prescribe that the weather at the airport of intended landing be at or above the operating minima at the estimated time of arrival. Paragraph 2.6.2.1 of ICAO annex 6, Part III, International Operations—Helicopters, Section III, International

General Aviation, Chapter 2, Flight Operations, requires that the heliport of intended landing meet operating minima at the estimated time of arrival.

This rule would require helicopter operators to evaluate weather conditions at the airport of intended landing from the estimated time of arrival until one hour after the estimated time of arrival when determining whether an alternate airport is required. Paragraph 2.6.2.2 of ICAO Annex 6, Part III, Section III requires an operator to evaluate weather conditions at the heliport of intended landing from two hours before to two hours after the estimated time of arrival or from the actual time of departure to two hours after the estimated time of arrival or from the actual time of departure to two hours after the estimated time of arrival.

Paragraph 2.7.1 of ICAO Annex 6, Part III, Section III states that an alternate shall be required in an operator's flight plan unless the weather conditions specified in paragraph 2.6.2.2 of that sectionprevail or other specific conditions related to isolated heliports are met and a point of no return (PNR) determination is made, if applicable. The weather conditions for the selection of an alternate differ from those specified in paragraph 2.6.2.2, and the rule does not address isolated heliports and PNR determinations.

The FAA has not adopted the ICAO standards for the reasons discussed earlier in this preamble.

Regulatory Evaluation Summary

Changes to Federal regulations must undergo several economic analyses. First. Executive Order 12866 directs that each Federal agency shall propose or adopt a

regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic effect of regulatory changes on small entities. Third, OMB directs agencies to assess the effect of regulatory changes on international trade. And fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation).

In conducting these analyses, the FAA has determined that this rule is not "a significant regulatory action" under section 3(f) of Executive Order 12866 and, therefore, is not subject to review by the Office of Management and Budget. The rule is not considered significant under the regulatory policies and procedures of the Department of Transportation (44 FR 11034; February 26, 1979). This rule will not have a significant impact on a substantial number of small entities and will not constitute a barrier to international trade. This rule will not impose any additional equipment, training, or other cost to the aviation industry. Therefore, there will be no compliance costs associated with the rule. The FAA estimates that the rule will provide $58 million ($41 million, present value) in benefits over the next 10 years. In addition, there will be the non-quantified benefits which include a reduction in the level of aircraft noise experienced by individuals on the ground when helicopters fly at higher altitudes and possible savings in corporate personnel time associated with enhanced corporate flight operations.

The rule will not present a significant impediment to either U.S. firms doing business abroad, or foreign firms doing business in the United States. Furthermore, the FAA certifies that the rule will not have a significant economic impact on a substantial number of small entities. The rule does not contain any Federal intergovernmental or private sector mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980, 5 U.S.C. 601–612, was enacted by the U.S. Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a regulatory flexibility analysis if a rule has a significant economic impact on a substantial number of small business entities. FAA's interim regulatory flexibility policy and guidelines establish threshold costs and small entity size standards for complying with RFA requirements, This guidance defines small entities in terms of size thresholds, significant economic impact in terms of annualized cost thresholds, and substantial number as a number which is not less than eleven and which is more than one-third of the small entities subject to the final rule.

This rule will impact entities regulated by part 91. The FAA has determined that there are no compliance costs associated with this rule. The FAA has also solicited comments during this rulemaking. No operators responded that they felt they would be negatively impacted from implementation of the rule. Only positive comments were received supporting the FAA's position that this rulemaking will not place any additional requirements on the aviation industry. Therefore, the FAA believes that there are no compliance costs associated with the rule. Accordingly, pursuant to the Regulatory

Flexibility Act of 1980, (5 U.S.C. 605 (b)), the FAA certifies that this rule will not have a significant impact on a substantial number of small entities.

International Trade Impact Statement

The provisions of this rule will have little or no impact on trade for U.S. firms doing business in foreign countries and foreign firms doing business in the United States.

Federalism Implications

The FAA has analyzed this rule under the principles and criteria of Executive Order 13132, Federalism. The FAA has determined that this action will 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, the FAA has determined that this final rule does not have federalism implications.

Unfunded Mandates Reform Act Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), codified in 2 U.S.C. 1501-1571, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant

intergovernmental mandate" under the Act is any provision in a Federal agency regulation that will impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain any Federal intergovernmental or private sector mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment or environmental impact statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this rulemaking action qualifies for a categorical exclusion.

Energy Impact

The energy impact of the notice has been assessed in accordance with the Energy Policy and Conservation Act (EPCA), Pub. L. 94-163, as amended (43 U.S.C. 6362) and FAA Order 1053.1. It has been determined that the final rule is not a major regulatory action under the provisions of the EPCA.

List of Subjects

14 CFR Part 21

Aircraft, Aviation safety, Exports, Imports, Reporting and recordkeeping requirements.

14 CFR Part 27

Aircraft, Aviation safety.

14 CFR Part 29

Aircraft, Aviation safety.

14 CFR Part 91

Aircraft, Airports, Aviation safety.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends parts 21, 27, 29, and 91 of Chapter I, title 14, Code of Federal Regulations, as follows:

PART 21—CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS

1. The authority citation for part 2 1 continues to read as follows:

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(g), 40105, 40113, 44701-44702, 44707, 44709, 44711, 44713, 44715, 45303.

SFAR No. 29-4 [Removed]

2. Remove Special Federal Aviation Regulation (SFAR) No. 29-4—Limited IFR Operations of Rotorcraft from part 2 1.

PART 27—AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT

3. The authority citation for part 27 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40 I 13, 4470 1-44702, 44704.

SFAR No. 29-4—Editorial Note

4. Remove the editorial note for SFAR No. 29-4 in part 27.

PART 29—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

5. The authority citation for part 29 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701-44702, 44704.

SFAR No. 29-4—Editorial Note

6. Remove the editorial note for SFAR No. 29-4 in part 29.

PART 91—GENERAL OPERATING AND FLIGHT RULES

7. The authority citation for part 91 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1155, 40103, 40113, 40120, 44101, 44111, 44701, 44709, 44711, 44712, 44715, 44716, 44717, 44722, 46306, 46315, 46316, 46504, 46506-46507, 47122, 47508, 47528-47531, articles 12 and 29 of the Convention on International Civil Aviation (61 stat. 1180).

SFAR No. 29-4 [Removed]

8. Remove Special Federal Aviation Regulation (SFAR) No. 29-4, Limited IFR Operations of Rotorcraft, from part 91.

9. Revise § 91.167 to read as follows:

§ 91.167 Fuel requirements for flight in IFR conditions.

(a) No person may operate a civil aircraft in IFR conditions unless it carries enough fuel (considering weather reports and forecasts and weather conditions) to—

(1) Complete the flight to the first airport of intended landing;

(2) Except as provided in paragraph (b) of this section, fly from that airport to the alternate airport; and

(3) Fly after that for 45 minutes at normal cruising speed or, for helicopters, fly after that for 30 minutes at normal cruising speed.

(b) Paragraph (a)(2) of this section does not apply if:

(1) Part 97 of this chapter prescribes a standard instrument approach procedure to, or a special instrument approach procedure has been issued by the Administrator to the operator for, the first airport of intended landing; and

(2) Appropriate weather reports or weather forecasts, or a combination of them, indicate the following:

(i) For aircraft other than helicopters. For at least 1 hour before and for 1 hour after the estimated time of arrival, the ceiling will be at least 2,000 feet above the airport elevation and the visibility will be at least 3 statute miles.

(ii) For helicopters. At the estimated time of arrival and for 1 hour after the estimated time of arrival, the ceiling will be at least 1,000 feet above the airport elevation. or at least 400 feet above the lowest applicable approach minima, whichever is higher, and the visibility will be at least 2 statute miles.

10. Revise § 91.169 (a), (b), and (c) to read as follows:

§ 91.169 IFR flight plan: Information required.

(a) Information required. Unless otherwise authorized by ATC, each person filing an IFR flight plan must include in it the following information:

(1) Information required under § 91.153 (a) of this part;

(2) Except as provided in paragraph (b) of this section, an alternate airport.

(b) Paragraph (a)(2) of this section does not apply if :

(1) Part 97 of this chapter prescribes a standard instrument approach procedure to, or a special instrument approach procedure has been issued by the Administrator to the operator for, the first airport of intended landing; and

(2) Appropriate weather reports or weather forecasts, or a combination of them, indicate the following:

(i) For aircraft other than helicopters. For at least 1 hour before and for 1 hour after the estimated time of arrival, the ceiling will be at least 2,000 feet above the airport elevation and the visibility will be at least 3 statute miles.

(ii) For helicopters. At the estimated time of arrival and for 1 hour after the estimated time of arrival, the ceiling will be at least 1,000 feet above the airport elevation, or at least 400 feet above the lowest applicable approach minima, whichever is higher, and the visibility will be at least 2 statute miles.

(c) IFR alternate airport weather minima. Unless otherwise authorized by the Administrator, no person may include an alternate airport in an IFR flight plan unless appropriate weather reports or weather forecasts, or a combination of them, indicate that, at the estimated time of arrival at the alternate airport, the ceiling and visibility at that airport will be at or above the following weather minima:

(1) If an instrument approach procedure has been published in part 97 of this chapter, or a special instrument approach procedure has been issued by the Administrator to the operator, for that airport, the following minima:

(i) For aircraft other than helicopters: The alternate airport minima specified in that procedure, or if none are specified the following standard approach minima:

(A) For a precision approach procedure. Ceiling 600 feet and visibility 2 statute miles.

(B) For a nonprecision approach procedure. Ceiling 800 feet and visibility 2 statute miles.

(ii) For helicopters: Ceiling 200 feet above the minimum for the approach to be flown, and visibility at least 1 statute mile but never less than the minimum visibility for the approach to be flown, and ;

(2) If no instrument approach procedure has been published in part 97 of this chapter and no special instrument approach procedure has been issued by the Administrator to the operator, for the alternate airport, the ceiling and visibility minima are those allowing descent from the MEA, approach, and landing under basic VFR.

* * * * *

Issued in Washington, DC, on JAN 13 2000

Jane F. Garvey
Administrator