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
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July, 1997

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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

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[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

Year	No Flight Plan		VFR Flight Plan		IFR Flight Plan	
	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.