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# NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

## SPECIAL INVESTIGATION REPORT

SAFETY OF THE AIR TOUR INDUSTRY IN  
THE UNITED STATES



6431B

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The National Transportation Safety Board is an independent Federal agency dedicated to promoting aviation, railroad, highway, marine, pipeline, and hazardous materials safety. Established in 1967, the agency is mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The Safety Board makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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SAFETY BOARD  
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**SPECIAL INVESTIGATION  
REPORT**

**SAFETY OF THE AIR TOUR INDUSTRY  
IN THE UNITED STATES**

**Adopted: June 1, 1995  
Notation 6431B**

**Abstract:** This report explains the National Transportation Safety Board's concerns about the safety of the air tour industry in the United States. The safety issues involved the adequacy of regulations pertaining to the air tour industry, the adequacy of past corrective actions, the use of emergency equipment, and the effectiveness of the oversight and certification of air tour operators by the Federal Aviation Administration.

## TABLE OF CONTENTS

Executive Summary .....	v
Background .....	1
Public Hearings .....	9
Local, State, and Federal Rules .....	9
SFAR 50-2 .....	9
SFAR 71 .....	9
Oversight of Kahului Heliport .....	13
Operations Specifications .....	14
Emergency Equipment Requirements .....	15
FAA Certification and Oversight of Air Tour Operators .....	16
FSDO Staffing .....	16
Data Analysis .....	17
Discussion .....	18
FAA Certification and Oversight of Air Tour Operators .....	18
Emergency Equipment .....	20
Helicopter Flotation Equipment Activation .....	21
Helicopter Height-Velocity (HV) Diagram .....	21
Minimum Altitudes and Standoff Distances .....	22
FAA National Air Tour Operator Data Base and Critical Definitions .....	23
Kahului Heliport .....	24
Findings .....	25
Recommendations .....	26
APPENDIX A RECENT AIR TOUR ACCIDENT INVESTIGATIONS .....	29
APPENDIX B SFAR 50-2 .....	37
APPENDIX C FAA HANDBOOK 8400.10 BULLETIN 92-01 .....	43
APPENDIX D 59 Federal Register 49138-49146 .....	47
APPENDIX B Safety Board Letter to Docket Regarding SFAR 71 .....	57

## **Executive Summary**

The National Transportation Safety Board has long been concerned about the occurrence of air tour accidents. From October 1, 1988, to April 1, 1995, the Safety Board has investigated 139 air tour accidents or incidents (see Appendix A for a complete list<sup>1</sup>). The Safety Board has also issued several safety recommendations over the past few years directed at reducing the frequency of such accidents.

In July of 1994, two accidents involving air tours occurred on the same day, and while the Safety Board determined that the probable causes of these accidents were mechanical and operational, respectively, investigation of the accidents revealed areas of concern applicable to the national air tour industry. Based on those findings, the history of accidents involving air tour operators, and the previous related safety recommendations, the Safety Board initiated a special investigation. As part of that investigation, the Board conducted public hearings during the week of October 10, 1994, in Phoenix, Arizona, and Honolulu, Hawaii, to obtain the views of those persons and organizations that directly participate in the air tour industry.

Both public hearings concentrated on safety issues affecting the air tour industry throughout the United States. Additionally, the public hearing in Hawaii focused on the investigations of the two air tour helicopter accidents that occurred on July 14, 1994. Specific areas addressed in the hearings were the adequacy of regulations pertaining to the air tour industry, the adequacy of past corrective actions, the use of emergency equipment, and the effectiveness of the oversight and certification of air tour operators by the FAA.

As a result of this special investigation, the Safety Board has developed 11 safety recommendations to prevent future accidents and to enhance the potential for occupant survival if an accident does occur.

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<sup>1</sup> Although the list includes sightseeing hot air balloons and glider operations, the scope of this report is limited to operations using powered airplanes or helicopters.

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**SPECIAL INVESTIGATION REPORT**

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**Background**

On June 18, 1986, a DHC-6 Twin Otter airplane and a Bell 206B Jet Ranger helicopter collided over the Grand Canyon, killing all 25 passengers and crewmembers aboard both aircraft.<sup>2</sup> As a result of the investigation and public hearing in connection with this accident, the Safety Board concluded that one of the contributing factors to the accident was "the failure of the FAA to exercise its oversight responsibility over flight operations in the Grand Canyon airspace. . . ."

Three of the Safety Board's 15 conclusions from its investigation were: (1) "The similarity of routes and limited number of scenic points overflown by scenic air tour operators increased the risk of a midair collision"; (2) "The FAA did not modify the regulations necessary to allow [it] to properly oversee Grand Canyon scenic air tour flight operations"; and (3) "The rule changes that the FAA has proposed should correct many of the deficiencies in current FAA authority to perform surveillance over Grand Canyon scenic air tours. However, the workload of the personnel in the Las Vegas FSDO may preclude their effective implementation."

Also a result of this investigation, the Safety Board made three recommendations to the FAA. The following two are pertinent to this special investigation:

Apply to revenue air tour flights the same flight and duty time limitations that apply to operations conducted under 14 CFR 135.265. (A-87-91)

Require all revenue air tour flights, regardless of the distance flown, to be subject to the regulatory provisions of 14 CFR Part 135. (A-87-93)

On June 5, 1987, the FAA issued Special Federal Aviation Regulation (SFAR) 50-1, which provided rules to enhance safety of overflight operations in the vicinity of the Grand Canyon National Park. After receiving comments from the Department of the Interior concerning the protection of resources in the Grand Canyon from adverse impacts associated with air traffic above the canyon, the FAA issued SFAR 50-2 on May 27, 1988.<sup>3</sup>

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<sup>2</sup> For more detailed information, read Aircraft Accident Report--"Grand Canyon Airlines, Inc., and Helitech Inc., Midair Collision Over Grand Canyon National Park June 18, 1986" (NTSB/AAR-87/03)

<sup>3</sup> SFAR 50-2 expires on June 15, 1993, however, the FAA plans to extend it (see Appendix B for a copy of SFAR 50-2).

Bulletin 92-01 cites background information about the June 18, 1986, accident over the Grand Canyon. It further states, "Aviation accidents within and around the Grand Canyon and other prominent attractions have heightened public interest in safety of sightseeing and air tour operations." It also refers to congressional concerns over aircraft noise and air safety, which resulted in Public Law 100-91 dated August 18, 1987. That law imposed flight restrictions at National Parks in the Grand Canyon, Yosemite, and Haleakala, Hawaii.

Bulletin 92-01 contains specific guidance regarding mandatory actions for FAA principal operations inspectors (POIs) to take in their oversight of the Grand Canyon operators and it contains recommended actions for POIs to take for air tour operations outside of the Grand Canyon area. Bulletin 92-01 also holds each FAA Regional Flight Standards Division and District Office responsible for identifying scenic areas that may attract air tours in their respective geographic areas. It states that POIs should "encourage" air tour operators in areas other than the Grand Canyon "...to cooperate in complying with procedures established for each scenic flight area. Information regarding special routes should be extensively distributed to avoid conflict with other airspace users."

The bulletin places responsibilities on POIs for the following areas:

1. Identifying scenic areas subject to air tour operations.
2. Identifying active and potential air tour operators.
3. Coordinating with air traffic control and airspace users to establish recommended routes, entry/exit points, altitudes, direction of flight, and necessary reporting points.
4. Encouraging participation of "non-certificated" air tour operators.

The bulletin requires Grand Canyon air tour operators to hold special operations specification<sup>5</sup> authorizations. It also states that routes and altitudes outlined in an operator's operations specifications "...should enhance collision avoidance procedures and aircraft noise abatement."

POIs for air tour operators in areas other than the Grand Canyon are required by Bulletin 92-01 to "recommend" that operators have a chapter in their operations manual containing an outline of air tour operations procedures covering clear depiction of air tour areas, entry/exit points, common radio frequencies, description of routes/altitudes/reporting points, weather, and pilot narration duties.

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<sup>5</sup> According to the FAA's former Air Carrier Operations Inspector's Handbook, Section 1 (301)(a) "Operations specifications are issued to supplement the operating rules and contain authorizations and limitations that are not specifically covered in the regulations. When approved, the provisions of the operations specifications are legally binding on an operator."

As a result of the FAA's issuance of Bulletin 92-01 and a review of its contents, the Safety Board classified Safety Recommendations A-89-108 and A-89-109 "Closed--Acceptable Action."

On February 10, 1990, a Bell 206L helicopter settled into the East River at New York City, New York.<sup>6</sup> The 14 CFR Part 91 air tour flight had just departed on what was intended to be a 15-minute flight down the East River, past the Statue of Liberty, and up the Hudson River. As the helicopter reached the end of the heliport platform and was flying slowly over the water, it settled in a nose low attitude into the river. At this point, none of the passengers were injured; however, one 13-year-old passenger was unable to exit the inverted helicopter and subsequently drowned.

The Safety Board determined that the probable causes of this accident were the following: "The pilot's misjudgment of the wind resulting in a downwind takeoff. Additionally the loss of lift when the helicopter flew off the heliport platform, prior to reaching effective translational lift, resulted in the helicopter settling into the water."

On September 29, 1992, a McDonnell Douglas MD 369E helicopter collided with a Bell 206B helicopter at Niagara Falls, Ontario, Canada. Both helicopters were engaged in air tour operations. The MD 369E crashed into the ground, killing all four occupants. The Bell 206B was able to land without any of the occupants being seriously injured. Both helicopters were converging on the falls at angles of about 20°, with the Bell 206B slightly ahead of and higher than the MD 369E.

The MD 369E was registered in the United States and operated out of Niagara Falls, New York, under the provisions of 14 CFR Part 91. The Bell 206 was Canadian registered and operated under Canadian Air Navigation Order (ANO) VII, Number 6, which is the equivalent of 14 CFR Part 135. The ANO "requires that the operator provide an operations manual for the use and guidance of operations personnel in the execution of their duties."

According to the Transportation Safety Board of Canada's (TSBC) report, "neither helicopter pilot saw the other helicopter in time to avoid the collision. Contributing to this occurrence were the crossing flight paths with only 200 feet of planned altitude separation, the masking effects of the cabin structures, and inadequate regulation and monitoring of the aircraft traffic situation over the Niagara Falls area."

As a result of this investigation, one of the actions taken by the TSBC was to recommend to Transport Canada (Canada's equivalent of the U.S. Department of Transportation) that American air tour companies operating in the Canadian airspace in the Niagara Falls area comply with 14 CFR Part 135. Transport Canada mandated the recommendation.

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<sup>3</sup> For more detailed information, read Field Accident Brief 1725.

On April 22, 1992, a Beech Model B18S crashed into mountainous terrain on the island of Maui, Hawaii, while on an air tour flight.<sup>7</sup> All eight passengers and the pilot were killed. Among other things, the Safety Board found that: (1) "The work of the Honolulu FSDO was insufficient to discover deficiencies found by the FAA Regional Aviation Safety Inspection Program and the Safety Board's investigation of this accident"; (2) "It is difficult to calculate specific accident exposure data for air tour operators, and other industry comparisons are not possible, because an FAA national data base from which to evaluate the magnitude of air tour operations does not exist"; and (3) "Regulations are needed for air tour operators that will enable FAA inspectors to require, rather than merely encourage, operators to adhere to procedures that offer the safety improvements of SFAR 50-2 and FAA Handbook 8400.10 [Air Transportation Operations Inspector Handbook] Bulletin 92-01."

Also as a result of its investigation, the Safety Board recommended, in part, that the FAA:

Revise the FARs as needed to create a specific classification for, and operating rules governing, commercial air tour operators based on the complexity of flight operations, aircraft flown, flight frequency, number of passengers carried, air traffic densities in the areas of operation, and other relevant factors. (A-93-8)

Establish comprehensive operations specifications and operations manual requirements for the certification of commercial air tour operators under a new or revised regulatory category. (A-93-9)

Identify airspace which warrants special protection due to the presence of commercial air tour operations. Create special operating rules for such airspace to reduce the potential for midair collisions and other accidents commensurate with meteorological and terrain considerations. (A-93-10)

Ensure that the regulatory basis and surveillance resources are in place to oversee the operations, equipment, airmen, and airspace associated with any selective attention directed toward commercial air tour operations. (A-93-11)

Devise a method for collecting data from air tour operators regarding flight hours, flight segments, and passengers carried that can be included in civil aviation exposure information for aviation industry comparisons. (A-93-12)

The FAA responded to the Board's recommendations in a letter dated April 29, 1993. In response to Safety Recommendations A-93-8 and -9, the FAA stated that it would issue an advance notice of proposed rulemaking (ANPRM), for public comment, proposing to place all

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<sup>7</sup> For more detailed information, read Aircraft Accident Report--"Tomy International, Inc., d/b/a Scenic Air Tours, Flight 22, Beech Model E18S, N342E, In-flight Collision With Terrain, Mount Haleakala, Maui, Hawaii, April 22, 1992" (NTSB/AAR-93/01)

commercial air tour operators under the provisions of 14 CFR Part 135. The Safety Board classified these recommendations "Open--Acceptable Action." However, FAA staff recently indicated that an ANPRM on this subject will not be issued until the end of 1995.

In response to Safety Recommendation A-93-10, the FAA stated that the specific guidance to POIs in Bulletin 92-01 regarding the need for and development of airspace restrictions met the intent of this recommendation. However, in its June 27, 1994, response to the FAA, the Safety Board noted that the accident prompting this recommendation occurred 4 months after Bulletin 92-01 was issued and that no action had been taken during those 4 months to develop any new special rules for Hawaiian air tour operations. Additionally, the Safety Board believed that the concern expressed in the recommendation needed to be emphasized to FAA inspectors by urging them to identify air tour operations in other areas that might require special consideration. The Safety Board therefore classified Safety Recommendation A-93-10 "Open--Unacceptable Action."

As a result of information obtained during this special investigation, however, the Safety Board now classifies Safety Recommendations A-93-8, -9, and -10 "Closed--Acceptable Action/Superseded" and will discuss the relevant safety issues and issue new safety recommendations, as appropriate.

The FAA agreed with Safety Recommendation A-93-11 and said it was considering rulemaking action to bring 14 CFR Part 91 commercial sightseeing operations under 14 CFR Part 135. Although the FAA has not brought forth rulemaking action, based on other activity taken to improve oversight in the Grand Canyon and Hawaii areas, the Safety Board subsequently classified the recommendation "Closed--Acceptable Action" on February 22, 1994.

The FAA indicated in its response that it was not the appropriate action agency for Safety Recommendation A-93-12 and that it had transferred the recommendation to the Department of Transportation (DOT) office responsible for collecting data from air carrier operators in accordance with 14 CFR Part 298, Subpart F. Although the staffs of the Safety Board, FAA, and DOT have discussed this issue, no formal correspondence has been received from the DOT. The Safety Board had originally classified Safety Recommendation A-93-12 "Open--Await Response"; however, as a result of this special investigation, Safety Recommendation A-93-12 is now classified "Closed--Acceptable Action/Superseded." This issue will be discussed later in this report and the appropriate recommendation issued to the DOT.

On July 14, 1994, two air tour accidents occurred in the state of Hawaii.<sup>8</sup> Both aircraft involved were Aerospatiale AS350 series helicopters. They were operated by different companies and both conducted forced landings in the water adjacent to the shore.

The first accident occurred off the island of Kauai at 1536 Hawaiian standard time; the helicopter involved was carrying a pilot and six passengers. The flight was proceeding parallel

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<sup>8</sup> For more detailed information, read Field Accident Briefs 1337 and 1338.

to the shoreline approximately 9 miles west of the community of Hanalei when a total loss of power occurred. The pilot performed an autorotation to the water approximately 150 feet from the shoreline, which was a base of a cliff. All occupants exited the helicopter uninjured but without life preservers on. Three of the occupants, including the pilot, drowned when they were unable to climb onto the rocks along the shoreline. The helicopter, which was not equipped with floats, sank and was recovered the following day.

Life preservers were found aboard the helicopter still located in their containers beneath each seat. The surviving passengers indicated that they had not been briefed that life preservers were aboard the helicopter.

Examination and testing of components indicated that a failure in the engine-driven fuel pump rendered it incapable of delivering fuel to the engine, causing an immediate and total power loss. The Safety Board determined that the probable causes of the accident were "failure of the engine-driven fuel pump, which resulted in the loss of power, and the lack of aircraft flotation equipment. Factors related to the accident were flight over water adjacent to terrain that afforded no suitable forced landing site, and lack of a passenger briefing by the operator on the location and operation of life preservers."

The second accident occurred off the island of Molokai at 1745 Hawaiian standard time. This helicopter also carried six passengers and the pilot. According to the pilot, the helicopter was in a hover approximately 50 feet above the water and 150 feet from the shore when he sensed a slowing of the engine/rotor system. The helicopter was equipped with inflatable floats, which the pilot activated as the helicopter entered the water. Of the seven occupants, the passenger who occupied the forward left seat received serious injuries due to water impact; the other six occupants were uninjured. After stabilizing on the surface, the occupants donned life preservers and swam to shore, where they spent the night before being rescued. The helicopter later drifted ashore and was recovered the following day.

The accident flight had been scheduled to tour the island of Maui. However, after receiving information from other tour pilots that the weather conditions along the planned route were deteriorating, the pilot commented over the radio to another company pilot, "I should take these people over to Molokai." He then conferred with his passengers and decided to take them to Molokai. The pilot did not state this to the other tour pilot he was in contact with nor did he notify his company of his intentions.

While maneuvering the helicopter to allow the passengers to view a large sea cave at Kapailoa Point, the helicopter began to descend slightly. The pilot said that when he sensed a slowing of the engine/rotor system, he "thought that perhaps the engine bleed valve had opened." The helicopter continued to descend toward the water while turning to the right.

To activate the helicopter's flotation system, the pilot was required to remove his hand from the collective control during the descent to (1) arm the system using a push button on the center console, and then (2) inflate the floats using the "Fire Floats" push-button, also located on

the center console. The Safety Board believes that the pilot's need to remove his hands from the collective affected his ability to control the helicopter and may have led to a harder impact than would have been otherwise experienced. According to an on-board video, which recorded the event, the elapsed time from the loss of directional control to water impact was about 4 seconds.

After water touchdown, the pilot instructed the passengers to don their life preservers, which were located in pouches under individual seats. All occupants then exited the aircraft and swam to shore, a rocky section of beach located in Anapuhi Bay about 150 feet from the helicopter.

The aircraft was noted as overdue by company personnel about 1925 and reported as overdue to the FAA at 2010. Search operations were concentrated on Maui along the scheduled route. As the unsuccessful search expanded, company pilots recalled the pilot's radio comments, and the search shifted to the island of Molokai. About 0550 the following morning, the helicopter and passengers were located.

The helicopter was subsequently recovered and airlifted to the owner's facility where Safety Board investigators conducted a detailed examination. No evidence of a preaccident structural or system failure or malfunction was found. The Safety Board determined that the probable causes of the accident were the following: "the pilot's failure to properly monitor power required versus power available to maintain rotor revolutions per minute (rpm), resulting in rotor rpm decay and a forced landing. Factors related to the accident were the pilot's change of the tour route without notifying the company, which delayed rescue, and the location of the arm and fire switches for the flotation equipment, which required the pilot to remove his hand from the collective control to activate that equipment."

## Public Hearings

The two accidents of July 14, 1994, and the historical concern about air tour operations precipitated the Safety Board's public hearings conducted the week of October 10, 1994. While the hearing in Honolulu partly dealt with the two July 1994 accidents, both hearings obtained testimony relative to air tour operations throughout the United States. Broad safety issues applicable to the air tour industry and the facts, circumstances, and conditions discovered during the two investigations were discussed.

The hearings addressed the following issues:

1. Local, State, and Federal rules for air tour operations, including oversight of Kahului Heliport;
2. Operations specifications for air tour operators;
3. Emergency equipment requirements for air tour flights; and
4. FAA certification and oversight of air tour operators.

After the hearings, the Board examined some of the issues further in depth; that information is also included in this section.

### Local, State, and Federal Rules

#### SFAR 50-2

Testimony from Grand Canyon operators and representatives of the Grand Canyon Air Tourism Association indicated that the implementation of SFAR 50-2 has resulted in increased FAA oversight for those operators who would otherwise qualify to operate under the provisions of 14 CFR Part 91, and now must operate under the provisions of 14 CFR Part 135.

As mentioned previously, SFAR 50-2 prescribes specific routes and altitudes to be followed by air tour flights. As a result, much of the Grand Canyon area is a "no-fly zone" for 14 CFR Part 91 operators, who receive less oversight by the FAA. At the Phoenix hearing, operators and their association testified that virtually all air tour companies had been "vehemently opposed" to the SFAR when it was first implemented. However, they now accept it as a change for the better. Examples cited were increased FAA oversight and an improved safety record. The spokesperson for the association stated, "Since the implementation of the SFAR, I'm proud to report that there's not been one accident in SFAR airspace and not one can be attributable to the SFAR in any way."

#### SFAR 71

At the Safety Board's public hearing in Hawaii, an FAA witness testified that "the accidents in July [1994] were pretty much the last straw, and based on those two accidents in

July a decision was made, [at] pretty high levels in Washington, that we had a safety problem with the air tours in Hawaii. SFAR 71 was the result of that concern."

SFAR 71, "Air Tour Operators in the State of Hawaii." Final Rule, was published in 59 Federal Register 49138 on September 26, 1994; public comment was invited after it was published and was to be received by the FAA by December 27, 1994. (See Appendix D for a copy of 59 Federal Register 49138-49146, which contains SFAR-71.)

SFAR 71 became effective October 26, 1994, and expires October 26, 1997. The rule applies to all airplane and helicopter visual flight rules (VFR) air tour flights within the State of Hawaii operating under the provisions of 14 CFR Parts 91 and 135. It defines an air tour as "any sightseeing flight conducted under VFR in an airplane or helicopter for compensation or hire." An air tour operator is defined as "any person who conducts an air tour."

Air tours in single-engine helicopters beyond the shore of any island are prohibited by SFAR 71, unless the helicopter is amphibious or is equipped with floats adequate to accomplish a safe emergency ditching, and personal flotation equipment is easily accessible for or worn by each occupant. The regulation also requires air tour pilots to brief passengers on any flight beyond the shore of any island on ditching procedures, use of required flotation equipment, and postditching emergency egress.

Except during takeoff and landing, or as required by air traffic control, "or as otherwise authorized by the Administrator," SFAR 71 states that air tour flights cannot operate below 1,500 feet above ground level (agl), closer than 1,500 feet to any person or property, or below any altitude prescribed by other regulations. The rule also prohibits helicopter pilots from operating within the avoidance zone of the height-velocity (HV) diagram, except for takeoffs and landings.<sup>9</sup>

With the exception of the FAA, Hawaii DOT, and the National Park Service, the parties who testified were opposed to the sections addressing operating limitations and minimum altitudes. Opposition was primarily directed toward the altitude restriction of 1,500 feet.

Testimony provided by FAA headquarters witnesses indicated that the 1,500 foot altitude restriction was not based on any specific data. The only rationale offered in FAA testimony for the 1,500 foot restriction was to provide more time for pilot decisionmaking and action in the event of an emergency. The manager of the FAA's Honolulu FSDO testified that the 1,500 foot rule was intended to provide operators "higher altitude in the event that they need to turn around," a higher level of visibility, and increased ability to reach suitable terrain in the event of a forced landing.

One operator spokesperson referred to the 1,500-foot restriction as an "unjustified impact."

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<sup>9</sup> The HV diagram (or deadman's curve) depicts the combinations of altitude and speed below which structural damage will occur in case of a power failure.

He continued that his corporate concerns were that "it will force what was [sic] once dispersed aircraft to one particular altitude, 1,500 feet." A witness for another operator was concerned that weather conditions would result in helicopter and airplane traffic becoming compressed at the same altitude resulting in a "terrible mishap in the skies over Hawaii." When asked by the Safety Board if the witness was predicting an in-flight collision, the witness replied, "I think that the likelihood of that occurring is significantly increased by this restriction."

The second operator's testimony was similar to the that of the first. He pointed out that it would be difficult for pilots to comply with the 1,500 foot altitude restriction because of the uneven terrain. A witness representing a third operator expressed concern that the SFAR would compress air tour operations along the shoreline with the fixed wing traffic. Manufacturer representatives were also opposed to the 1,500 foot restriction and standoff distance.

In contrast, the manager of the FAA's Honolulu FSDO testified that the air tour industry had 15 or 16 fixed-wing airplanes and 96 helicopters spread over four islands, with no "major concentration of aircraft." He testified that the current practice of pilots using radios for position reporting and the increased visibility requirement of 3 miles would help prevent midair collisions. He compared that to Hawaii's pre-SFAR situation of "the concentration of aircraft flying low level under a cloud ceiling with visibility requirements of only a half mile."

The National Park Service spokesperson testified primarily on the effect of SFAR 71 regarding overflight of volcanos and lava flows. This witness said that the SFAR, specifically the 1,500 foot altitude and standoff restrictions, would enhance safety around the volcanos and lava flows, which due to heat and hazardous gases are considered dangerous at close range.

Referring to SFAR 71's definition of the helicopter HV diagram as an operating limitation, the Eurocopter witness testified that "as a manufacturer, we take strong exception to the inclusion of the HV curve as a limitation as is currently proposed in the SFAR." He added that helicopters certified under the provisions of 14 CFR Part 27 have never been required to use the curve as a limitation.

The Bell witness also testified that his company was "strongly opposed" to an aircraft limitation on operations within the HV diagram. He reported that operating near the threshold of the diagram meant that in the event of an autorotation "you're probably going to bend the gear." In response to questioning on the ability of a pilot to autorotate with zero airspeed and no wind, he stated that it would "bend the aircraft up pretty bad, but that doesn't mean that anybody's going to get hurt." He added that the curve was established for where landing gear damage would occur, not "on whether someone gets hurt or not." It was his opinion that a prudent pilot should minimize his time in that portion of the curve, rather than be prohibited from such operation.

Several air tour operator witnesses testified that SFAR 71 was written and implemented without input from the air tour operators. They stated that the only party to the hearings involved in the development of SFAR 71 was the FAA. Some air tour operator witnesses stated that the

first copy of the proposed SFAR viewed by them was the one sent to them by the Safety Board in preparation for the Hawaii hearing.

Although he did not testify at the public hearings, the FAA Program Manager for Scenic Area Air Tour Operations provided additional information to the Safety Board on the history of air tour rulemaking in Hawaii. In April 1993, FAA flight standards staff traveled to Hawaii and met with the president and directors of the Hawaii Helicopter Operator's Association (HHOA) "on all the issues." The following month, the HHOA and FAA held the first official meeting at the Washington, D.C., offices of Helicopter Association International (HAI). In January 1994, the FAA held public hearings on problems associated with the air tour industry on the Hawaiian islands of Kauai, Maui, Oahu, and Hawaii. HHOA, which represented most air tour operators, provided most of the written and verbal testimony; some additional testimony from independent operators was also heard. All hearings were well attended, with "standing room only."

According to the FAA Program Manager for Scenic Area Air Tour Operations, rulemaking began as a result of the FAA's public hearings and letters received by the FAA over 3 to 4 years. Project approval was granted in late May 1994; the FAA team began work in June on a standard rulemaking project for a special rule in Hawaii. After the two accidents on July 14, 1994, the project evolved into "emergency rulemaking" pending approval, with more assets added to the effort. The FAA pursued three separate initiatives: (1) rulemaking; (2) national aviation safety inspection program; and (3) a self audit from operators. It was the opinion of the program manager that the operators were surprised by the nature of the SFAR being emergency rulemaking, rather than by the rulemaking itself.

In a letter dated October 27, 1994, the Safety Board provided the FAA with its comment on SFAR 71. (See Appendix E.) In a summary of the Safety Board's opinion, the letter stated, "The Safety Board is pleased to recognize the initiative of the FAA to improve air tour safety with the issuance on September 22, 1994, of SFAR No. 71. . . Several of the provisions of SFAR 71 will provide an immediate improved level of safety for the Hawaiian air tour industry. However, the Safety Board must reiterate that a permanent nationwide policy for air tour operations is appropriate to define the industry, track its performance, and ensure equal treatment regardless of the points of tourist interest or the location of the operator."

On April 19, 1995, NTSB staff reviewed comments submitted on SFAR 71. Two hundred and sixty-three formal submissions had been logged by the FAA. Two large submissions incorporated comments from numerous individuals. More submissions that had been received had not yet been logged into the system.

The majority of people who commented were opposed to all or some aspects of the SFAR. Those against the SFAR cited both safety considerations and economic impact on the air tour industry and tourism in general. Numerous organizations involved in tourism-related businesses, including the Hawaii Chamber of Commerce and the County of Kauai, cited negative economic impact. Several individuals had concern for the increased potential for a midair collision due to increased air tour traffic at 1,500 feet agl. Another group of people were against

the SFAR because it imposed routing changes that increased their exposure to the overflight of air tour traffic.

The majority of people in favor of the SFAR took that position because of the anticipation of reduced noise impact from air tour helicopters; a small percentage had safety concerns. Many of those in favor of the SFAR cited the sanctity of the National Park System. Within that group of people favoring the SFAR, several recommended expanding the 1,500 foot clearance to a 2-mile standoff distance. Several of the group members complained about violations of the 1,500 foot restriction.

Since the implementation of SFAR 71, the Safety Board has been monitoring the activities of the FAA regarding implementation and surveillance. The FAA has sent three four-man teams, each of which has stayed for a month, to Hawaii since the enactment of SFAR 71 to support implementation. A final team will arrive in mid-June of 1995 and stay until mid-July. As a result of the surveillance conducted by the teams, the FAA has opened 25 enforcement cases and FAA headquarters has approved deviations from the SFAR for 18 operators to conduct operations below 1,000 feet agl in certain areas. According to the FAA, numerous operators have requested deviations to operate below 500 feet agl, but none of those requests have been approved so far. In addition, the teams must do all followup on any of their enforcement actions so their activity does not impact the workload at the Honolulu FSDO.

#### **Oversight of Kahului Heliport**

In Hawaii, the facilities used by air tour operators are frequently on airports owned and operated by the State. Many of these airports provide commercial service and are at least partially Federally funded. Although it was not a factor in either of the July 14, 1994, accidents, the Safety Board became aware of congestion among helicopter operations and serious safety problems at the Kahului Heliport, which is a sub-facility on Maui's Kahului Airport.

The operators and FAA estimated that there are 200 to 300 cycles (takeoffs and landings) per day on the ramp at Kahului Heliport, which is classified as a nonmovement area because the area cannot be seen from the airport control tower. According to the FAA's Air Traffic Control Handbook, a nonmovement area includes taxiways, aprons, and ramps not under the control of air traffic. This classification places arrivals and departures from those areas in the same category as traffic operating at an uncontrolled airport, requiring pilots to maintain visual separation from other aircraft.

An air tour operator described ramp operating conditions as a "potential accident waiting to happen." Operators' testimony indicated that there was a lack of taxiway lane marking, landing zone marking, and clearance marking. In addition, Safety Board investigators' observations and operator testimony revealed the common practices of (1) hot refueling (refueling with the engine/rotor system operating); (2) helicopters departing and arriving over standing helicopters that are both being hot refueled and loading/unloading passengers (often without adequate supervision); and (3) backing out of parking areas without a taxi director or other means

to maintain visual separation. Operators described a very loosely organized ramp managed by the pilots and operators with little oversight by the Hawaii DOT or the FAA.

A spokesperson for the State of Hawaii DOT testified that the Kahului Heliport/Airport was the State of Hawaii's property and not the responsibility of the operators to manage. He said that it was "a random operation" and acknowledged that congestion was a problem. He expressed concern about compliance with FAA Advisory Circular (AC) 150-5390-2A, "Heliport Design," which provides guidance in the planning, construction, and layout of heliports.

Specifically, Chapter 6 provides guidance for helicopter facilities located on airports. This chapter discusses takeoff and landing surfaces, dimensions and clearance requirements, spacing criteria, marking and lighting, surface movement, hovering, taxiing, parking, passenger walkways, and passenger services. It also provides reference to other chapters that discuss safety considerations and details of the above. In addition, according to the AC, item 4 on page iii, conformity with the standards set forth in the AC are a prerequisite to Federal grant-in-aid assistance for an airport/heliport.

According to an FAA witness, the Kahului Airport receives Federal funds. This witness also stated that the FAA had been involved in planning for the heliport. He also indicated that neither the FAA nor the Hawaii DOT had reviewed or taken any action on a new layout and operating plan submitted by the operators.

Safety Board investigators compared the information provided in this AC and the layout and operation of the Kahului Heliport and determined that operations were not consistent with the provisions of the AC.

#### **Operations Specifications**

The manager of the FAA's Air Transportation Division testified that a rulemaking effort was under way addressing the requirement for all air tour operators to be under the provisions of 14 CFR Part 135. When he was asked why SFAR 50-2 required Grand Canyon air tour operators to be under the provisions of 14 CFR Part 135, he stated that it was a way for the FAA to use operations specifications to achieve compliance with the SFAR, which he felt was "the centerpiece of what people working together can do."

He explained that a 14 CFR Part 91 operator does not have operations specifications, which allow the FAA to issue special requirements, particularly procedural, to operators. One of the supervisors from the FAA FSDO in Las Vegas was asked if a different level of safety was required under the provisions of 14 CFR Part 135 over 14 CFR Part 91. He responded that because "we do control it [Part 135 operators] through operations specifications, a higher level of safety [is] required."

According to Handbook 8400.10, operations specifications are desirable because they "can be tailored to suit an individual operator's needs," and "provide an effective method for

establishing safety standards [that] address a wide range of variables." Topics covered in the operations specifications include issuance and applicability, definitions and abbreviations, aircraft authorization, special authorizations and limitations, exemptions and deviations, management, operational control, airport information, weather data, security, passenger operations, and aeromedical operations.

Safety Board investigators examined operations specifications for both operators involved in the July 14, 1994, accidents and found that both operators' operations specifications met the requirements of 14 CFR Part 135. They contained no special authorizations or limitations. The only deviation from 14 CFR Part 135 addressed the location of pilot flight and rest records.

In the operations specifications for both operators, note 1 of the "En route Authorizations, Limitations, and Procedures" section stated "Unless it is necessary for takeoff or landing, carriage of passengers with a helicopter, over water is prohibited unless the aircraft is operated at an altitude that would allow it to reach land and a suitable forced landing area, in the case of an engine failure, or it is equipped with FAA approved helicopter flotation devices."

#### **Emergency Equipment Requirements**

An FAA witness testified that, except for SFAR 71, no regulations specifically addressed emergency equipment for air tour operators. Therefore, other than in Hawaii, emergency equipment requirements for air tours are those required by 14 CFR Parts 91.205 and 135.183.

14 CFR 91.205 states that aircraft operated for hire over water and beyond power-off gliding distance from shore must have approved flotation equipment that is readily available to each occupant. 14 CFR 135.183 requires a single-engine helicopter carrying passengers over water to operate at an altitude that would allow it to reach land in the event of a power loss. Exceptions to this rule are for takeoffs and landings and if the helicopters are equipped with flotation devices.

The Bell witness testified that based on Bell's extensive overwater experience in the Gulf of Mexico, where the operators use inflatable life preservers in addition to aircraft flotation, inflatable life preservers were safer than noninflatable life jackets or life vests, which can snag on articles in a water-filled cabin during escape.

The Bell witness also testified about the stability of a helicopter on floats following an emergency landing in the water. According to the witness, helicopters tend to remain upright with the floats deployed in up to 25-foot seas. Assuming that impact forces were within limitations, even helicopters that did not remain upright would continue to float while inverted. Impact forces beyond those limitations can result in float separation, or failure to operate as designed.

Similar testimony in Hawaii from several operators showed that they had no definition for "suitable landing area" and that they had attempted to get clarification from the FAA's

Honolulu FSDO without success. The FAA had issued Federal Register Volume 59, No. 185, on September 26, 1994, that addressed previous Safety Board recommendations regarding the lack of such a definition. The section entitled "Need for Emergency Rulemaking," describes terrain in which a "safe emergency landing" can be made. It is neither referred to as a "suitable landing area," nor is any such definition published in SFAR 71.

## **FAA Certification and Oversight of Air Tour Operators**

### **FSDO Staffing**

At the time of the public hearings, the Las Vegas, Nevada, FSDO had a four-person unit dedicated to air tour operators in the Grand Canyon. As of April 21, 1995, that unit has been expanded to six inspectors. Comparison of testimony in both hearings found FAA oversight more prevalent in the Grand Canyon than in Hawaii. This heightened oversight in the Grand Canyon was one result of SFAR 50-2 requiring all operators to be certified under 14 CFR Part 135.

Witnesses who represented the three Hawaiian air tour operators were concerned about the local FSDO staffing. They expressed concern that the FAA surveillance and the local FSDO staffing in Hawaii were inadequate. After viewing videos of air tour flights performing maneuvers in excess of 90° angle of bank and flying low near trees, one operator testified that he thought this "inappropriate" flying was an oversight issue for the operator and the FAA.

The office manager for the FAA's Honolulu FSDO was questioned about the staffing level of his office. He responded that he had 36 people on his staff, which was 75 percent of the office's authorized level. Questioning revealed that his staffing and authorization at the time of the accidents were 33 on board and 60 authorized, and that since the accident, the office's authorization had decreased to 48. He further stated that he did not know the details of these changes, that his staffing numbers had gone from 48 to 60 and back to 48 based on decisions from FAA headquarters.

Currently, according to information provided by the Manager, Western Pacific Region, the Honolulu FSDO is authorized 48 positions and has 36 on board with four additional positions hired and in training. The Western Pacific Region manager stated that he has requested authority to fill the remaining eight positions this fiscal year but is skeptical of getting approval due to fiscal restraints.

The office manager outlined an inspector's prioritized functions as surveillance, certificate management, investigation, and training. He believed that his funding and staffing for surveillance was "adequate," but that his office fell a "little short" in certificate management. He added that if he were able to staff to his authorized level, he would be able to close that gap.

Recruiting and retention were discussed and the witness acknowledged that both were a problem. Cost of living was identified as the "biggest reason that we have that difficulty." (FAA staff receive a 22.5 percent cost-of-living allowance, which the witness considered to be

inadequate.) The high cost of housing was termed "difficult" for a GS-13 or 14 inspector. Other witnesses had mentioned 40 percent as the approximate cost-of-living penalty compared to the mainland.

The manager of the FAA's Flight Standards Division for the Western Pacific Region stated that the Honolulu office was the "fourth worst staffed office in the region," which is made up of 17 offices. He agreed that the shortfall showed up most "in staffing to serve certificates and certificate management."

The FAA has a staffing standard that is based on a job task analysis. The staffing standard, which was recently upgraded, is used by FAA management to determine regional staffing levels. FSDO staffing is then developed by regional and FSDO managers.

Although the Grand Canyon hearing did not focus as much on FAA staffing, there was testimony on the impact of a reduction in local personnel due to early retirements. The spokesperson for the Grand Canyon Air Tour Council reported that the managers that retired early were experienced and had been deeply involved in oversight of SFAR 50-2.

#### **Data Analysis**

Safety Board staff asked the manager of the FAA's Air Transportation Division in Washington, D.C., how the FAA monitored activity of the air tour industry. He reported that no specific data base existed and that the FAA could look at activity in areas such as the Grand Canyon or Las Vegas for sample data. Such data only exist for Part 135 commuters or on-demand air carriers. He acknowledged that the FAA could not distinguish air tour operations from other Part 135 operations and that there was no plan to make that distinction.

He also reported that the FAA was aware of "somewhat less than 200" air tour operators in the United States. When asked how he came up with that number, he responded, "I think we made a lot of phone calls and did the best we could to come up with an accurate number." Similarly, he was unable to determine how many FAA inspectors were assigned to oversee the air tour industry. "Where we really capture what the inspector does, it would be again back to the [Part] 135 certificate involved." He added that the Las Vegas FSDO is the only office with specific personnel dedicated to air tour operations. This witness also testified that he thought present inspector manning levels were sufficient to oversee the air tour industry. He estimated that over 40 operators were in the Grand Canyon area.

Testimony further revealed that the FAA's problem in tracking the air tour industry is the lack of definitions for "air tours" and "air tour operators." While those terms are defined in SFAR 71, the regulation only applies to the State of Hawaii. Therefore, for the rest of the air tour industry in the United States, there are no definitions. The manager of the FAA's Air Transportation Division testified, "we need to get those definitions in place and then we'll know exactly what we have." He also referred to a draft of an AC intended to "help us in some of these areas of definition for both industry and the inspector and the FAA."

## Discussion

### FAA Certification and Oversight of Air Tour Operators

The evidence gathered during this special investigation, as well as the past history of air tour operations accidents, demonstrates that further improvements in FAA oversight and new regulations would enhance the safety of air tour operations nationwide. The FAA's rulemakings for the Grand Canyon, Hawaii, and Niagara Falls all followed tragic accidents. The Safety Board believes that the FAA should act to provide definitive guidelines and sufficient oversight to assure operator compliance with those guidelines before another accident occurs.

Existing regulations that specifically address air tour operations are SFAR 50-2, applicable in the Grand Canyon, and SFAR 71, applicable in Hawaii. The SFARs adequately address the unique operations of air tour operations for these areas; however, as with any SFAR, the actions are temporary, requiring periodic renewal, and are applicable only to those specific areas. The Safety Board believes that the FAA needs to establish permanent regulations and develop national standards for air tour operators that incorporate specific provisions for unique operations and/or geographical characteristics. The problems exposed by the Board's investigations of air tour accidents in areas of the United States other than the Grand Canyon and Hawaii areas are similar to those experienced by the air tour operators in those areas.

The Safety Board believes that the public assumes that an operator offering commercial service, such as an air tour or scenic flight for revenue, is regulated and surveilled to a level of safety higher than that applied to the normal general aviation operator. The Safety Board also believes that the higher level of safety is consistent with operations covered by the provisions of 14 CFR Part 135. Some examples of the differences are pilot qualifications, aircraft maintenance requirements, the need for company flight following, and so on.

Because of these differences, the Safety Board believes that the exception in 14 CFR 135.1 allowing "nonstop sightseeing flights that begin and end at the same airport, and are conducted within a 25 statute mile radius of that airport" to be operated under the provisions of 14 CFR Part 91, should be eliminated. This exception was addressed in SFAR 50-2, so that all Grand Canyon air tours must be conducted under the provisions of 14 CFR Part 135. According to testimony in the Phoenix hearing, the operators, the FAA, and the National Park Service, were pleased with the results of that requirement.

SFAR 71 did not require all air tour operations in Hawaii to be under the provisions of 14 CFR Part 135. While the Safety Board is aware that the majority of operators in Hawaii operate under the provisions of 14 CFR Part 135, some operators in Hawaii do not, and therefore, two levels of safety exist for air tour operators. This situation is similar for most of the United States.

The Safety Board believes that the air tour industry and its customers would be best served by FAA oversight under the provisions of 14 CFR Part 135, or equivalent requirements, for all commercial air tour operations, because 14 CFR Part 135 uses operations specifications as a means for standardizing overall requirements and for defining special conditions unique to different locations. In its report of the April 22, 1992, Maui air tour accident, the Safety Board concluded that the FAA could enhance the safety level of air tour operations by expanding 14 CFR Part 135 or by creating a new regulation for these operations. While the FAA has since stated that it intends to issue rulemaking on this topic, the rulemaking action has not yet begun. The Safety Board believes that action on this issue should be undertaken immediately for air tour operations using powered airplanes or helicopters.

Another benefit in requiring all air tour operators to operate under the provisions of 14 CFR Part 135, or an equivalent regulatory requirement, would be to help the FAA identify staffing needs to oversee the industry. This investigation revealed conflicting statements about the level of staffing necessary in the Honolulu FSDO to conduct effective surveillance of the air tour operators in that area. Although the staffing level is far below the authorized levels, managers stated that they were able to effectively oversee their assigned carriers. However, because those persons who conduct air tour operations under the provisions of 14 CFR Part 91 are not required to comply with special limitations that can be levied through operations specifications and operations manuals, the FAA has less leverage to control and surveil those operators.

The Safety Board believes that air tour operations are unique from the on-demand air taxi and scheduled commuter operations conducted under the provisions of 14 CFR Part 135. Therefore, the operations specifications of all air tour operators should contain requirements specific to the geographical area of certain operators, similar to those enacted for the Grand Canyon. The suggested wording of such provisions contained in Handbook 8400.10 Bulletin 92-01 is quite appropriate.<sup>10</sup> However, those provisions are not mandatory outside the area covered by SFAR 50-2 (Grand Canyon airspace). This special investigation revealed that these voluntary measures have not been applied on a widespread basis.

Bulletin 92-01 contains other nonmandatory guidance that urges FSDOs and POIs to encourage air tour operators, other than at the Grand Canyon, to include certain specific items in a chapter in the operations manual. The items listed in Bulletin 92-01 are appropriate measures to enhance the safety of air tour operations and should be made mandatory for all U.S. air tour operators. The guidance contained in Bulletin 92-01 also urges POIs to work with operators and local officials to identify scenic areas and to develop airspace usage practices, including special routes, altitudes, reporting points, etc. The Safety Board believes that this guidance should also be mandatory.

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<sup>10</sup> "Special Requirements: Note 1. Air tour/sightseeing operations are authorized to be conducted over list appropriate area, river, or prominent point of interest, in accordance with procedures outlined within the operations manual."

## **Emergency Equipment**

The original draft of SFAR 71 called for both life preservers and helicopter flotation systems for all flights over water. However, the final version of that regulation allowed operators to provide either one or the other. Testimony from operators and manufacturers pointed out that an emergency water entry might easily exceed the certificated vertical speed limitations of current skid-mounted helicopter flotation systems and result in failure of the equipment to perform as expected.

Testimony was also heard regarding the difficulty involved in donning life preservers in the limited time available to passengers from the onset of an emergency to an autorotation water landing. In the case of the air tour helicopter accident on July 14, 1994, in Hawaii, where three occupants drowned following evacuation from the helicopter, the life preservers had been stored in a cabinet and were not readily available during the emergency. Having these devices already donned would prepare passengers for water entry. This is especially significant for passengers who are children, elderly, handicapped, non-English speaking, or not familiar with aircraft operations, none of which is atypical of air tour passengers.

Helicopter stability when floating in rough seas or surf was addressed at the Hawaii hearing. Skid-mounted floats are designed to keep the helicopter upright in varying sea states and surf conditions. Although it is possible for the helicopter to roll inverted, that is still considered a better option than to sink, as persons may have more time to evacuate the helicopter. Nevertheless, the Safety Board believes that rough water conditions, including surf around Hawaii, make the combination of passengers wearing life preservers and the helicopter being equipped with flotation equipment an optimum situation. Therefore, the Safety Board urges the FAA to reconsider the provisions of SFAR 71 regarding the requirement for passengers to don life preservers when air tour helicopters are operated over water.

The Safety Board also believes that the FAA should evaluate this safety feature for other air tour locations that operate frequently over water. 14 CFR Part 135.183 requires that passenger-carrying helicopters operating over water be equipped with flotation devices. Although statistics are not readily available, the Safety Board believes that a significant number of scenic areas are attractive to air tours because of their proximity to water. Examples include Hawaii, the Statue of Liberty, and Niagara Falls. The Safety Board believes that a national standard for helicopter operations over water is needed.

Another problem identified is the lack of a definition for "suitable landing area." Terrain in which a "safe emergency landing" could be made is described in Federal Register Volume 59, Number 185, dated September 26, 1994, as "relatively level and free of obstructions." It specifically lists obstacles, rugged terrain, congested areas, and water as factors that make an emergency landing site unsuitable. However, this description is neither referred to as a suitable landing area, nor is any such definition published in SFAR 71. The Safety Board believes that this definition should be published on a national basis for all aircraft, not just those involved in air tours; otherwise, it is left totally to the discretion of the pilot.

## **Helicopter Flotation Equipment Activation**

Various configurations of flotation activation systems are available, e.g., mechanical and electrical. All electrical systems require an arming action by the flightcrew that is distinct from the activation action. Many operators, both civil and military, specify that flotation systems be armed when operating at a low level over water, allowing minimal reaction time in the event of ditching. However, there is no regulatory requirement addressing the design or operation of the arming and actuation of the float system.

Bell Helicopter recommends that floats on its 206BIII and 206 L-3 aircraft be armed when below 500 feet above the water and when being operated at 60 miles per hour (52 knots), which is the maximum velocity of arming or inflation of floats. The Aerospatiale AS350D Flight Manual contains a supplement for emergency flotation gear. Within that supplement are limitations establishing 135 knots as the maximum speed for floats to be armed or inflated and a requirement that "when flying over water at an altitude below 400 feet the flotation gear system must be armed."

Flotation systems are available with activation switches located either on the primary flight controls (cyclic or collective) or elsewhere in the cockpit. The location is dictated by manufacturer or customer preference. In a helicopter, float activation switches, which are not located on the primary controls, require pilots to remove their hands from the flight controls during the ditching maneuver. The Safety Board believes that the opportunity for a successful ditching is reduced if the pilot must interrupt maneuvering of the helicopter during the critical final phase of an emergency water landing. The problem can be resolved by requiring that helicopters operated over water with flotation equipment installed be equipped with activation systems located on primary flight controls.

## **Helicopter Height-Velocity (HV) Diagram**

SFAR 71, Section 5, addresses the HV diagram for helicopters. The HV diagram defines the relationship between the altitude and airspeed of a helicopter and the helicopter's performance during an autorotation landing necessitated by a power loss. SFAR 71 makes operating within the avoidance zone of this diagram a violation of the operating limitations of the helicopter, except for approach to and transition from a hover.

Testimony in the Hawaii hearings from both Bell Helicopter and Eurocopter indicated that a power loss experienced while operating within this part of the HV diagram did not imply injury to occupants. Rather, it made an autorotation landing without damage to the helicopter less likely, and more demanding for the pilot. Current and historical guidance furnished to pilots advises them to limit flight time spent in the avoidance area of the HV diagram. This is the philosophy for helicopter certification and operation throughout the world, not just for air tour operators in Hawaii.

### **Minimum Altitudes and Standoff Distances**

Section 6 of SFAR 71 prohibits flight below 1,500 feet above the ground, closer than 1,500 feet to any person or property, or below any altitude prescribed by other regulations. This restriction applies to both fixed and rotary-wing aircraft. Operators testifying at the Hawaii hearing were ardently against this restriction. The operators claim that this limitation will force what was once dispersed air tour traffic to converge at an altitude of 1,500 feet, flying fewer routes with sufficient terrain clearance. Flights that were previously spread out within canyons will now be forced to concentrate near the center to meet the altitude and standoff distance requirements.

Route restriction is necessary due to a combination of rapidly rising terrain and weather patterns. Weather changes rapidly in the islands. Weather patterns around the islands should be a major factor in setting any minimum altitude for air tour operations. The orographic effect of changing windward and leeward air flow produces cloud formations along tour routes that must be considered when defining altitude requirements.

As cloud bottoms form at altitudes below 2,000 feet, air tour aircraft cannot operate in that area. This is due to basic VFR cloud avoidance minimums contained in 14 CFR 91.155 requiring 500 feet of separation distance below clouds. Therefore, aircraft are forced to converge on other available routes where cloud heights permit operation. The operators also believe that the 1,500 foot standoff distance will also eliminate some inland routes, forcing more traffic to the coastline and over water.

During the Safety Board's investigation of the collision between two air tour flights over the Grand Canyon in 1986, one of the findings was that the similarity of routes and limited number of scenic points overflowed by air tour operators increased the risk of a midair collision. The Safety Board believes that the 1,500 foot altitude and standoff distance requirement of SFAR 71 may have a similar effect in Hawaii.

Questioning of FAA witnesses revealed that 1,500 feet was an arbitrary altitude. It appears to the Safety Board that the FAA was motivated to establish a minimum altitude because SFAR 50-2 has one in the Grand Canyon, where it is working well. The Safety Board is also aware that terrain conditions and weather patterns make the Grand Canyon flight environment and that of the Hawaiian islands very different. One witness at the public hearing put it very succinctly, "If you took Hawaii and turned it upside down and made it flat, the SFAR 50-2 -- might be appropriate for Hawaii. But if you took the canyon and turned that one upside down, then that SFAR would probably not be appropriate."

In support of its ruling, FAA witnesses testified on what it considered to be risks of low flying air tours. The Safety Board believes that these concerns can be best addressed by operations specifications specifically crafted for each operator, based on the local environment.

The Safety Board shares the operators' concerns that the altitude restriction may result in

a compression of air tour traffic at a common altitude of 1,500 feet, spread over fewer routes, and in areas with the best weather. Before SFAR 71 became effective, helicopters operated at lower altitudes and were not affected until weather conditions got significantly worse. A helicopter's ability to safely operate at lower altitudes appears to be the primary reason that helicopters comprise the vast majority of the air tour fleet in Hawaii.

The Safety Board supports the premise of operating at an altitude no lower than that which will allow sufficient time for a pilot to select a suitable landing site and prepare the aircraft and passengers for an emergency landing. However, the Safety Board believes that the current SFAR 71 altitude restriction should be reviewed to assure that there is no increase in the potential for in-flight collisions or inadvertent encounters with cloud layers.

The Safety Board believes that the air tour operators in Hawaii are in a position to make significant contributions to the improvement of their industry similar to the way in which their Arizona counterparts did when the FAA developed SFAR 50-2 for the Grand Canyon. Public hearing testimony indicated that air tour operators in Hawaii recognize that safety could be improved with modifications to flightpaths and minimum altitudes. The Safety Board believes that the FAA needs to conduct further discussions with the interested parties in Hawaii to resolve the issue of optimum altitudes and routes for air tours. The FAA should also consider the negative effects of such restrictions that may result in unintended degradation of the existing level of safety.

#### **FAA National Air Tour Operator Data Base and Critical Definitions**

FAA testimony revealed that no data base exists for air tour operations. This is partly due to a lack of national definitions for air tour and air tour operator. This lack of definitions limits the ability of the FAA to determine the location and number of air tour operators. SFAR 71 contains definitions for both terms, but the definitions apply only to the Hawaiian air tour industry. The Safety Board believes that such definitions should apply nationally. Without clear definitions and a data base, the FAA cannot estimate how many air tour operators there are and where they are; therefore, it cannot properly staff its district offices to provide appropriate oversight.

In its report on the 1992 air tour accident in Maui, Hawaii, the Safety Board found that it was difficult to calculate specific accident exposure data for air tours, and other industry comparisons were not possible, because a national data base did not exist. Although a national data base still does not exist, information provided by the Helicopter Association International, Hawaii Helicopter Operators Association, and internal accident data, shows that the industry has grown. Thus, this finding has become even more significant. The Safety Board has recently revised its accident/incident data base to specifically identify air tour operations. However, definition and exposure data are necessary to properly evaluate the safety of this portion of the aviation industry.

**Kahului Heliport**

Witnesses at the Hawaii public hearing described the congested and uncontrolled conditions at the Kahului Heliport as a "potential accident waiting to happen." The Kahului Heliport receives Federal funding, thereby mandating compliance with the provisions of AC 150-5390-2A. The Safety Board believes that oversight by both the FAA and the Hawaii DOT is deficient and that a significant hazard to public safety is present as a result of the physical layout and operation of the facility. Therefore, the Safety Board believes that the FAA and State of Hawaii DOT need to coordinate their collective efforts to bring the airport into compliance with the AC.

## Findings

1. According to testimony at the public hearing, air tour operators believe that the implementation of SFAR 50-2 in 1988 has created a safe operating environment over the Grand Canyon. Since the date of its implementation, no accidents have occurred in the airspace covered by SFAR 50-2.
2. SFAR 71, which prescribes requirements for air tour operators in Hawaii, was developed and implemented without coordination with the Hawaiian air tour industry. It contains controversial provisions, including optimum flight altitudes, stand-off distances, and helicopter flight envelope operating limitations. These provisions should be reviewed by all parties and resolved by the FAA.
3. FAA Handbook 8400.10 Bulletin 92-01, contains detailed nonmandatory guidance to POIs regarding the oversight of air tour operators. However, this voluntary guidance has not resulted in the identification of air tour attractions or the establishment of special operating procedures in locations other than Hawaii and the Grand Canyon. The provisions of Bulletin 92-01 should be made mandatory on a nationwide basis.
4. The level of safety of air tour operations could be improved by creating a national standard for air tour operations that contains definitions specific to the air tour industry and specific requirements, including unique operations specifications to accommodate localized unique conditions, similar to the special conditions contained in SFAR 50-2, SFAR 71, and the voluntary provisions of FAA Handbook 8400.10 Bulletin 92-01.
5. The lack of a national data base for air tour operations precludes effective evaluation of the accident rate of air tour operators on the traditional basis of flight hours, cycles, and passengers carried. Also, the adequacy of staffing levels of FSDOs to oversee air tour operators is difficult to evaluate because of the lack of national standards and a data base to establish the magnitude of this portion of commercial aviation.
6. Operation of helicopters over water by air tour operators with both flotation equipment for the helicopters and flotation gear worn by each occupant would improve the potential survivability of crash landings in the water.
7. Various models of helicopters have a variety of limitations and operating practices regarding the arming of flotation equipment that are adequate, if the specified provisions are adhered to. The activation switches for emergency floats should be installed on the flight controls of all helicopters equipped with floats.
8. Kahului Airport is not in compliance with the provisions of Advisory Circular 150-5390-2A, a specific requirement for any airport receiving Federal funding.

## Recommendations

As a result of this special investigation, the National Transportation Safety Board recommends that the Department of Transportation:

Establish and maintain a data base of all air tour operators that would provide data for use in determining the scope of air tour operations and accident rates that can be used to assess the safety of the air tour industry. (Class II, Priority Action) (A-95-57)

The National Transportation Safety Board recommends that the Federal Aviation Administration:

Develop and implement national standards by December 31, 1995, within 14 CFR Part 135, or equivalent regulations, for all air tour operations with powered airplanes and rotorcraft to bring them under one set of standards with operations specifications and eliminate the exception currently contained in 14 CFR Part 135.1. (Class II, Priority Action) (A-95-58).

Require special conditions within the operations specifications established by A-95-58 for all air tour operators, similar to the special conditions contained in SFAR 50-2, SFAR 71, and FAA Handbook 8400.10 Bulletin 92-01, to accommodate localized airspace restrictions and other unique conditions for such operations. (Class II, Priority Action) (A-95-59)

Develop and issue appropriate definitions for key terms such as "air tour," "air tour operator," and "suitable landing area." (Class II, Priority Action) (A-95-60)

Use the data for air tour operators as recommended in A-95-57 to the Department of Transportation, to provide adequate staffing at all FSDOs that have air tour operations within their geographic boundary. (Class II, Priority Action) (A-95-61)

Require all occupants of helicopter air tour flights to wear life preservers when the helicopter is operating over water, whether float equipped or not, unless it is operated at an altitude that allows it to reach a suitable landing area in the case of an engine failure. (Class II, Priority Action) (A-95-62)

Require that all helicopters equipped with inflatable flotation systems to have the activation switch for those systems located on one of the primary flight controls. (Class II, Priority Action) (A-95-63)

As soon as possible, conduct meetings with interested parties in Hawaii to resolve the issues of optimum flight altitudes and stand-off distances for air tour flights. These discussions should consider any positive or negative effects on safety of the current provisions of SFAR 71. (Class II, Priority Action) (A-95-64)

Coordinate with the Department of Transportation of the State of Hawaii to achieve compliance with AC 150-5390-2A for all helicopter facilities owned and/or operated by the State. (Class II, Priority Action) (A-95-65)

The National Transportation Safety Board recommends that the Department of Transportation of the State of Hawaii:

Coordinate with the FAA to achieve compliance with AC 150-5390-2A for all helicopter facilities owned and/or operated by the State. (Class II, Priority Action) (A-95-66)

The National Transportation Safety Board recommends that the Hawaii Helicopter Operators Association:

Coordinate with the Federal Aviation Administration and as soon as possible, conduct meetings with other interested parties in Hawaii to resolve the issues of optimum flight altitudes and stand-off distances for air tour flights. These discussions should consider any positive or negative effects on safety of the current provisions of SFAR 71. (Class II, Priority Action) (A-95-67)

**BY THE NATIONAL TRANSPORTATION SAFETY BOARD**

**JAMES E. HALL**  
Chairman

**ROBERT T. FRANCIS II**  
Vice Chairman

**JOHN A. HAMMERSCHMIDT**  
Member

**June 1, 1995**

**APPENDIX A  
RECENT AIR TOUR ACCIDENT INVESTIGATIONS**

October 1, 1988 to April 1, 1995

DATE	LOCATION	AIRCRAFT TYPE	F	S	M	N	OCCURRENCE
10/16/88	Sedona, Arizona	Piper PA-32-300	5	0	0	0	Loss of power (total)
12/12/88	Hanalei, Hawaii	Hughes 369E	0	0	0	5	Loss of power (partial)
02/03/89	Key West, Florida	Waco YMF	0	0	3	0	Loss of control in flight
02/06/89	Marathon, Florida	Waco UPF-7	0	0	1	2	Total loss of engine power/cruise
03/11/89	Jacksonville, Florida	Adams AX-9	0	1	3	1	Miscellaneous/other balloon/landing
03/21/89	Marathon, Florida	Waco UPF-7	0	0	0	2	Loss of control ground
05/20/89	Waialae Falls Hawaii	Aerospatiale AS350D	0	0	7	0	Loss of power (partial)
06/11/89	Waipio Valley Hawaii	Beech H18	11	0	0	0	VMC collision with canyon wall
07/24/89	Kalapana, Hawaii	Hughes 269C	0	1	0	2	Loss of power (total)
08/19/89	Volcano, Hawaii	Aerospatiale AS350D	0	1	5	1	Loss of power (partial)
05/30/89	Niagara Falls, New York	Hughes 369HS	0	0	0	4	In-flight collision with object
06/03/89	Meeker, Colorado	Boeing PT-17	1	1	0	0	Loss of control in flight/approach
06/17/89	Lockport, Illinois	Hughes 269C	0	0	3	0	In-flight collision with object/takeoff
06/18/89	Michigan City Indiana	Piper PA-22	0	5	1	0	Loss of control in flight/Takeoff
06/21/89	Rio Rancho, New Mexico	Raven Ind. S77A	0	2	1	6	Hard landing/balloon
08/02/89	Plymouth, New Hampshire	WACO UPF-7	0	0	0	3	Loss of control on ground
08/06/89	Louisville, Colorado	Balloon Works Firefly 8B	0	1	1	2	In-flight encounter with weather/landing

08/14/89	Wisconsin Dell Wisconsin	Bell 47G-2A-1	0	1	2	0	Hard landing/takeoff
09/08/89	Boston, Mass.	Enstrom F-28	0	0	0	3	Loss of control in flight/hover
10/01/89	Bingham, Maine	Cessna 172p	0	2	4	0	In-flight collision takeoff
10/08/89	Rockwood, Maine	Cessna 185F	0	0	0	3	Landing roll
10/10/89	Grand Canyon, Hawaii	Cessna T207	0	3	0	0	Loss of power (partial)
10/31/89	Marathon, Florida	Waco YMF	0	0	0	3	Loss of control on ground
12/08/89	Waimea, Hawaii	Hughes 369HS	0	0	0	5	Loss of engine power (partial)/cruise
03/03/90	Phoenix, Arizona	Cameron O-105	1	1	2	0	Fire Takeoff/Initial climb
03/03/90	Miami, Florida	Bell 47G	0	0	2	1	Loss of engine power (total)/cruise
03/25/90	Rockledge, Florida	Bell 47D1	0	0	0	3	Loss of engine power (total)/cruise
04/15/90	Creswell, Florida	Airship 600	0	0	0	4	Loss of power
04/28/90	Have De Grace, Maryland	Lake LA-4-200	0	0	0	3	On ground collision with terrain/water Takeoff
05/02/90	Napa, California	Thunder Ltd. AX9-14C	0	1	0	4	In-flight encounter with weather/cruise
05/13/90	Marathon, Florida	Enstrom F-28A	0	0	0	3	Airframe/component/ system failure/takeoff
05/19/90	Biloxi, Mississippi	HB-TH-13T	0	1	0	1	Misc./Other
05/23/90	Griffin, Florida	Robinson R22B	1	1	0	0	Loss of control in flight
06/05/90	Marble Canyon Arizona	Cessna 210L	0	0	0	4	Overrun
06/15/90	Cedar Rapids, Iowa	Bell 47G3B1	3	0	0	0	Loss of control in flight/maneuvering
06/17/90	Grand Canyon, Arizona	Cessna T207A	0	0	0	8	On ground collision with object
06/17/90	Moorpark, California	Balloon Works Firefly 7B	0	1	0	3	Hard landing
06/21/90	Randle, Washington	Hughes 369HS	0	0	0	4	In-flight collision with object

06/23/90	Hanapepe, Hawaii	Hughes 369D Hughes 369D	0	0	0	10	Midair collision maneuvering
06/25/90	Aialak Bay, Alaska	Cessna C207	5	0	0	0	In-flight collision with terrain/water
06/30/90	Glacier, Washington	Aerospatiale	1	0	0	4	Passenger rotor contact
07/08/90	Washington, Penn.	Piper PA-31-350	0	0	0	10	On ground collision with object
07/13/90	Toutle, Hawaii	Hughes 369D	0	0	2	3	Forced landing/ maneuvering
08/07/90	Napa, California	Thunder Balloons Ltd. AX9-140 Aerostar Intl. S-66A Balloon Works Firefly 8 Balloon Works	0	1	5	1	In-flight encounter with weather/cruise
			0	1	3	5	
			0	1	1	5	
			0	1	2	5	
08/26/90	Taos, New Mexico	Cameron Balloons U.S. O-84	1	0	0	3	In-flight collision with object/landing
08/17/90	Juneau, Alaska	Aerospatiale AS350B	0	0	0	6	Loss of engine power (total)
09/29/90	Vacaville, California	Balloon Works Firefly 9	0	1	0	8	In-flight encounter with weather/cruise
11/01/90	Gatlinburg, Tennessee	Bell 47J-2	0	1	2	0	In-flight collision with object/landing
12/18/90	Keanae, Hawaii	MD 369D	0	0	0	4	Loss of power (partial)
03/16/91	Las Vegas, Nevada	Cessna T207A	0	0	0	8	Loss of power (total)
05/05/91	Keanae, Hawaii	Hughes 369HS	0	0	3	2	Loss of power
05/13/91	Grand Canyon, Arizona	Cessna 207A	7	0	0	0	Loss of power (total)
06/06/91	Lihue, Hawaii	Bell 206B	0	4	0	0	Loss of power (total)
07/15/91	Iliamna, Alaska	De Havilland DCH2	0	0	0	2	In-flight collision with terrain/water
07/22/91	Toutle, Washington	Bell 206B	1	1	2	1	Loss of control in flight/maneuvering
07/24/91	Kahului, Hawaii	Aerospatiale AS350B	0	0	0	6	Loss of power (total) non-mechanical
08/08/91	Grand Canyon, Arizona	Cessna 402C	0	0	0	10	On ground collision with object

08/22/91	Eklutna Lake, Alaska	Cessna 172	3	1	0	0	In-flight collision with terrain/water
08/23/91	Fredonia, Arizona	Cessna R182	0	0	0	4	Loss of power (total) mechanical
08/24/91	Apple Creek, Ohio	Douglas DC-3	0	0	1	26	Loss of engine power takeoff initial climb
09/15/91	Penuelas, Puerto Rico	Bell 47G-3B-1	0	0	0	3	Loss of control in flight/takeoff
09/15/91	Redmond, Washington	Raven/Aerostar S-60A	0	1	1	2	Hard landing
10/12/91	Catawissa, Penn.	Bell 47G-3B-1	0	0	4	0	Loss of control in flight
10/14/91	Hilo, Hawaii	Aerospatale AS 350D	0	0	0	7	Loss of power /hover
11/09/91	Hilo, Hawaii	Bell 206B	0	1	2	1	Hard landing/adverse weather
11/10/91	Hilo, Hawaii	Beech D18S	0	0	0	11	Loss of power (total) mechanical
12/10/91	Temple Bar, Arizona	Piper PA31-350	5	0	0	0	In-flight collision with terrain in WX conditions
01/13/92	Temple Bar, Arizona	Cessna	2	3	0	0	Loss of power (partial)/ hard landing
02/05/92	Bridgetown, Barbados	Bell 206-B-III	5	0	0	0	Unknown
04/04/92	St. Petersburg, Florida	Waco J1-C	0	0	0	3	Loss of control on ground/landing
04/11/92	Mount Vernon, Washington	Enstrom 280 FX	0	0	0	2	In-flight encounter with weather/landing
04/22/92	Makawao, Hawaii	Beech E-18s	9	0	0	0	In-flight collision with terrain in WX conditions
05/09/92	Ruth Glacier, Alaska	Cessna 172	0	0	0	4	In-flight collision with object
05/09/92	Ruth Glacier, Alaska	Cessna 185	0	0	0	6	In-flight collision with object
05/30/92	Volcano, HI. Nat. Park	MD 369D	0	0	0	5	Airframe/component/ system/failure
06/09/92	Big Sur, California	Cessna 172P	3	0	0	0	Undetermined
06/19/92	Waikoloa, Hawaii	Bell 206L3	0	0	7	0	Main gear collapsed
06/23/92	Sedona, Arizona	Waco UPF-7	2	0	0	1	Loss of power (total)

07/06/92	Driggs, Idaho	Avian Balloon Magnum IX	0	0	0	6	In-flight collision with object/landing
08/25/92	Surfside Beach Florida	Waco WMF-5	0	0	3	0	Hard landing
09/16/92	Hana, Hawaii	Aerospatiale AS 350B	7	0	0	0	In-flight encounter with weather
09/21/92	Volcano, Hawaii	Bell 47-G4A	0	0	3	0	Loss of control in flight/hover
09/29/92	Niagara Falls, New York	Bell 206-B MD 500E	4	0	1	4	Midair collision
12/04/92	Kameula, Hawaii	Hughes 369C	0	0	1	3	Loss of power (total) mech failure/malfunction
12/07/92	Kahului, Hawaii	Hughes 269B	0	0	0	2	Loss of control
12/21/92	Hilo, Hawaii	Hughes 369B	0	0	5	0	Loss of engine power
01/02/93	Orlando, Florida	Balloon Works Firefly 7-15	0	0	1	2	Hard landing
01/25/93	Volcano, HI. Nat. Park	Fairchild Hiller FH-1100	4	1	0	0	Loss of control in flight
02/20/93	Chena Hot Spr Alaska	Maule M5	0	0	0	4	Loss of control ground
04/22/93	Calistoga, California	Aerostar AX-9	0	1	0	5	Hard landing
05/01/93	Bentonville, Arkansas	Raven S-55A	0	0	0	3	Loss of control on ground/standing
06/02/93	Skagway, Alaska	Piper PA32-300	0	0	2	4	Loss of engine power (total)
06/15/93	Orlando, Florida	Hughes 369HS	0	0	2	1	Investigation incomplete
06/18/93	Juneau, Alaska	Piper PA-32	0	0	2	4	Collision with terrain water
06/19/93	Panama City, Florida	Bell 47G	0	0	3	0	Investigation incomplete
07/05/93	Coloma, California	Raven S-60A	0	1	0	2	Miscellaneous/other landing
07/20/93	Jacksonville, Florida	Head AX8-105	0	1	0	2	Hard landing
07/24/93	Colorado Sprgs Colorado	Balloon Works 7B-15	0	1	0	2	Hard landing
08/01/93	Milford, New Hampshire	Balloon Works Fire FLY-715	0	1	1	1	Landing

08/07/93	Tuscayan, Arizona	Bell 206L1 Bell 206L3	0	2	10	2	Mid air collision
08/08/93	Woody Creek, Colorado	Cameron US N145 Balloons	6	0	0	0	In-flight encounter with weather/cruise
08/08/93	Woody Creek, Colorado	Thunder & Colt 240A	0	4	7	0	In-flight encounter with weather/cruise
08/22/93	Auburn, Washington	Hiller UH-12E	0	0	0	3	Loss of engine power (partial)/takeoff
09/02/93	Centre Hall, Penn.	Piper PA-28-161	0	0	0	4	On ground collision with terrain/water/takeoff
09/10/93	Ogden, Utah	Aerospatiale AS365N2	1	2	2	0	In-flight collision with water
09/11/93	Cooper Landng Alaska	Cessna 180	0	3	1	0	Lost power after takeoff
10/06/93	St. Paul, Minnesota	Boeing B-75N1	0	0	2	0	Investigation incomplete
10/29/93	New York, New York	Bell 2066	0	0	0	6	Total loss of engine power cruise/normal
02/23/94	Honouliuli, Hawaii	Aerospatiale AS350-B	0	1	1	5	In-flight collision with terrain
02/28/94	Huelo, Hawaii	Aerospatiale AS350-D	0	0	0	5	Loss of engine power (partial)/landing
03/12/94	Sedona, Arizona	Head AX9-118	0	2	0	3	Airframe/component/ system failure/descent
03/25/94	National Park Hawaii	Hughes 369D	0	0	2	0	Loss of control in flight/hover
03/25/94	Orlando, Florida	Bell 206L	0	2	5	0	Loss of engine power /takeoff
04/18/94	Hanapepe, Hawaii	Hughes 369D	1	4	0	0	Loss of engine power /takeoff
04/22/94	Marathon, Florida	Bell 47D1	2	1	0	0	Airframe/component/ system failure/cruise
05/07/94	Crystal Beach Texas	Hiller UH-12B	0	0	0	3	Loss of engine power/ takeoff
05/20/94	Ionia, Michigan	Burkhart Grob BG 103	0	0	0	2	Hard landing
06/00/94	West Chicago, Illinois	CAN-56 Balloon	0	3	0	0	No Narrative
06/05/94	Acton, California	Balloon Works Firefly 8	0	1	3	0	In-flight collision with terrain/water
06/22/94	JunEAU, Alaska	De Havilland DHC-3 Otter	7	4	0	0	In-flight collision with terrain/water

07/02/94	Bristol, New Hampshire	Cessna 172	0	0	1	2	In-flight collision with terrain
07/14/94	Hanalei, Hawaii	Aerospatiale AS-350B	3	0	0	4	Loss of power/mechanical/ditching
07/14/94	Kapailoa, Molokai, HI.	Aerospatiale AS-350B	0	1	0	6	Loss of power/ditching
07/18/94	McCarthy, Alaska	Piper PA31-350	0	5	3	0	In-flight collision with terrain/takeoff
07/18/94	Anchorage, Alaska	Cessna 206	0	0	1	2	Loss of engine power/cruise
07/19/94	Juneau, Alaska	Aerospatiale AS-350	0	0	0	7	In-flight collision with terrain/water
07/21/94	Haines, Alaska	Cessna T207A	0	0	1	2	Loss of engine power
07/24/94	Seaside, Oregon	Hughes 369HS	2	0	0	0	In-flight collision with terrain/water
07/31/94	Reading, New Jersey	Boeing-Stearman Piper J-3	0	0	0	4	On ground collision with object
08/07/94	Kodiak, Alaska	De Havilland DHC-2	6	1	0	0	In-flight collision with terrain/water
08/11/94	KuKuihaele, Hawaii	Aerospatiale AS-350D	0	0	0	7	Loss of power/collision with terrain
08/15/94	Bloomington, Illinois	Colt 120A	0	2	1	2	No Narrative
09/04/94	Kilauea Crater, Hawaii	Hughes 500E	0	0	0	5	Dynamic Roll-Over
10/24/94	Kaupo, Hawaii	Aerospatiale AS-350D	0	0	0	4	Loss of engine power
11/15/95	Peoria, Arizona	TC-180 balloon	0	0	0	7	High wind - hard landing
02/13/95	Tuscayan, Arizona	Piper PA-31-350	8	2	0	0	Loss of power, one eng - loss of control
03/18/95	San Geronio, California	Enstrom F28-C	0	0	0	3	Loss of control
03/25/95	Burnet, Texas	Hughes 369HS	0	0	0	3	Loss of Power

## SUMMARY

From October 1, 1988, to April 1, 1995, there have been 139 air tour investigations involving 722 people and 143 aircraft. Of the 722 people, passengers and crew, injuries reported are 117 (16.2%) fatalities, 86 (11.9%) serious injuries,

135 (18.7%) minor injuries, and 384 (53.2%) with no injuries. Of the 143 aircraft 65 (45.5%) are helicopters, 47 (32.9%) are airplanes, 28 (19.6%) are balloons and other aircraft include 1 airship and 1 glider (<2%). Injuries per aircraft type are as follows:

<u>Aircraft</u>	<u>Number</u>	<u>Occupants</u>	<u>F</u>	<u>S</u>	<u>M</u>	<u>N</u>
Helicopter	62	290	35	26	76	163
Airplane	45	255	63	30	27	135
Balloon	27	150	8	30	32	80
Airship	1	4	0	0	0	4
Glider	1	2	0	0	0	2

Of the 139 accident sites, 87 were in 28 of the 48 contiguous states, with 34 in Hawaii, 16 in Alaska, one in Puerto Rico, and one in the Caribbean. States with more than three accidents in the stated period are as follows:

Alaska	16	Florida	18
Arizona	15	Hawaii	34
California	9	Washington	6
Colorado	5		

**APPENDIX B  
SFAR 50-2**

**federal register**

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**Wednesday  
April 12, 1995**

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**Part III**

**Department of  
Transportation**

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**Federal Aviation Administration**

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**14 CFR Parts 91 and 135  
Special Flight Rules in the Vicinity of the  
Grand Canyon National Park; Proposed  
Rule**

**DEPARTMENT OF TRANSPORTATION**

Federal Aviation Administration

14 CFR Parts 91 and 135

(Docket No. 25149, Special Federal Aviation Regulation (SFAR) No. 90-2)

Special Flight Rules in the Vicinity of the Grand Canyon National Park

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

**SUMMARY:** This notice proposes to extend, for 2 years, the effectiveness of SFAR No. 50-2, which contains procedures governing the operation of aircraft in the airspace above Grand Canyon National Park. SFAR No. 50-2 which originally established the flight regulations for a period of 4 years, has previously been extended to allow the National Park Service (NPS) time to complete studies concerning aircraft overflight impacts on the Grand Canyon, and to forward its recommendations to the FAA. The NPS study, completed in September 1994, recommended alternatives, such as use of quiet aircraft, additional flight-free zones, altitude restrictions, operating specifications, noise budgets, and time limits. This proposal would allow the FAA sufficient time to review thoroughly the NPS recommendations as to their impact on the safety of air traffic at the Grand Canyon National Park, and to initiate any appropriate rulemaking action.

**DATES:** Comments must be received on or before May 12, 1995.

**ADDRESSES:** Comments on this NPRM should be mailed, in triplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-200), Docket No. 25149, 800 Independence Avenue, SW., Washington, DC 20591. Comments also may be submitted electronically to [nprmcrmts@mail.bq.faa.gov](mailto:nprmcrmts@mail.bq.faa.gov). The official docket may be examined in the Rules Docket, Office of the Chief Counsel, Room 918, 800 Independence Avenue, SW., Washington, DC, weekdays, except Federal holidays, between 8:30 a.m. and 5 p.m.

**FOR FURTHER INFORMATION CONTACT:** Mrs. Ellen Crum, Air Traffic Rules Branch, ATP-230, Airspace Rules and Aeronautical Information Division, Air Traffic Rules and Procedures Services, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; Telephone: (202) 267-8783.

**SUPPLEMENTARY INFORMATION:****Comments Invited**

Interested persons are invited to participate in this proposed rulemaking by submitting such written data, views, or arguments as they may desire. Comments are also invited relating to the aeronautical, environmental, energy, federalism, or economic impact that might result from adopting the proposals in this notice. Substantive comments should be accompanied by cost estimates. Comments should identify the regulatory docket or notice number and be submitted in triplicate to the Rules Docket address specified above. All comments received on or before the specified closing date for comments will be considered by the Administrator before taking action on this proposed rulemaking. The proposals contained in this notice may be changed in light of comments received. All comments received will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each substantive public contact with FAA personnel concerned with this rulemaking will be filed in the docket. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a readressed, stamped postcard on which the following statement is made: "Comments to Docket No. 25149." The postcard will be date stamped and mailed to the commenter.

**Availability of NPRM**

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Public Affairs, APA-220, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-3484. Communications must identify the docket number of this rule. Persons interested in being placed on a mailing list for future rules should request from the above office a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

**Background**

On March 26, 1987, the FAA issued SFAR No. 50 (subsequently amended on June 15, 1987; 52 FR 22734) establishing flight regulations in the vicinity of the Grand Canyon. The purpose of the SFAR was to reduce the risk of midair collision, reduce the risk of terrain contact accidents below the rim level,

and reduce the impact of aircraft noise on the park environment.

On August 18, 1987, Congress enacted legislation that required a study of aircraft noise impacts at a number of national parks and imposed flight restrictions at three parks: Grand Canyon National Park in Arizona, Yosemite National Park in California, and Haleakala National Park in Hawaii (Pub. L. 100-91).

Section 3 of Pub. L. 100-91 required that the Department of the Interior (DOI) submit to the FAA recommendations to protect resources in the Grand Canyon from adverse impacts associated with aircraft overflights. The law mandated that the recommendations (1) provide for substantial restoration of the natural quiet and experience of the Grand Canyon; (2) with limited exceptions, prohibit the flight of aircraft below the rim of the Canyon; and (3) designate zones that were flight free except for purposes of administration of underlying lands and emergency operations.

Further, Pub. L. 100-91 required the FAA to prepare and issue a final plan for the management of air traffic above the Grand Canyon. It also required that the plan establish a means to implement the recommendations of the DOI without change unless the FAA determined that executing the recommendations would adversely affect aviation safety. In that event, the FAA was required to revise the DOI recommendations to resolve the safety concerns and to issue regulations implementing the revised recommendations in the plan.

In December 1987, the DOI transmitted to the FAA preliminary recommendations for an aircraft management plan at the Grand Canyon. The recommendations included both rulemaking and nonrulemaking actions.

On May 27, 1988, the FAA issued SFAR No. 90-2 revising the procedures for operation of aircraft in the airspace above the Grand Canyon (53 FR 20284, June 2, 1988). The rule implemented DOI's preliminary recommendations for an airspace management plan with some modifications that the FAA initiated in the interest of aviation safety.

Pub. L. 100-91 also required the DOI to conduct a study, with DOT technical assistance, to determine the proper minimum altitude to be maintained by aircraft when flying over units of the National Park System. The research was to include an evaluation of the noise levels associated with overflights. It required that before submission to Congress, the DOI provide a draft report (containing the results of its studies) and recommendations for legislative

and regulatory action to the FAA for review. The FAA is to notify the DOI of any adverse effects these recommendations may have on the safety of aircraft operations. Additionally, section 3 of Pub. L. 100-91, required DOI to submit a report to Congress regarding the success of the Grand Canyon airspace management plan, and any necessary revisions, within 2 years of the effective date of the plan. The FAA was to report whether any of these recommendations would have an adverse effect on safety. On June 15, 1992, because of a delay in the completion of the DOI study, the FAA promulgated a final rule to extend the expiration date of SFAR No. 50-2 to June 15, 1995 (57 FR 26786).

On September 12, 1994, the DOI submitted its final report and recommendations to Congress. The report recommends numerous revisions to the current flight restrictions contained in SFAR No. 50-2. In addition, the report recommends the use of quiet aircraft, additional flight-free zones, altitude restrictions, operating specifications, noise budgets, and time limits for flight in the vicinity of the Grand Canyon.

Upon completing a review of the NPS congressional report, the FAA may amend SFAR No. 50-2 through the rulemaking process. However, at the present time, the FAA is reviewing and analyzing these recommendations to determine an appropriate course of action. Therefore, the FAA is proposing to extend the provisions of SFAR No. 50-2 for 2 years from the June 15, 1995, expiration date to allow sufficient time to determine if there is a need to adjust SFAR No. 50-2.

#### Environmental Review

As discussed above, Pub. L. 100-91 required the DOI to submit a report to Congress within 2 years of implementation regarding the success of the final airspace management plan for the Grand Canyon, including possible revisions. Now that this report has been forwarded to both Congress and the FAA, the FAA is required to comment on whether any of these revisions would have an adverse effect on aircraft safety.

Pub. L. 100-91 essentially reflects a decision by Congress that a final airspace management plan, currently set forth in SFAR No. 50-2, should continue permanently with any appropriate modifications developed as a result of the follow-on study. The statute and its legislative history show that Congress considered the environmental and economic concerns inherent in regulating the navigable airspace over the Grand Canyon. Since

Congress, and not the FAA, determined to make permanent an airspace management plan as delineated in SFAR No. 50-2, this extension of SFAR No. 50-2 does not require compliance with the National Environmental Policy Act of 1969 (NEPA).

Assuming, for the sake of argument, that the FAA has discretion to terminate SFAR No. 50-2, the proposal to extend its effectiveness for 2 more years is categorically excluded from the requirements of the NEPA. (See FAA Order 1050.1D, Par. 31(a)(4), "Policies and Procedures for Considering Environmental Impacts.") A documented categorical exclusion has been placed in the docket.

Alternately, the analysis in the 1988 Environmental Assessment (EA) and the Finding of No Significant Impact remain valid and support a determination that this extension is not likely to significantly impact the environment. The proposed extension will not cause significant environmental impacts because it will not change the volume of traffic, the altitude of flight routes, or the noise characteristics of the aircraft typically used in canyon flights between now and 1997.

This extension will enable the FAA to consider recommendations that the DOI forwarded in September 1994 to enhance the effectiveness of the SFAR. Based upon its studies, the DOI has concluded that the SFAR has significantly reduced noise impacts in areas of the Grand Canyon. However, the DOI believes that benefits may be lost unless additional restrictions are adopted.

#### 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, the Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade. In conducting these analyses, the FAA has determined that this NPRM is not "a significant regulatory action" as defined in the Executive Order and the Department of Transportation Regulatory Policies and Procedures. This NPRM would not have a significant impact on a substantial number of small entities and would not constitute a barrier to international trade.

SFAR No. 50-2 was justified based on DOI's December 1987 benefit-cost analysis. This analysis stated that 40 to 45 operators conducted air tours over the Grand Canyon with an estimated revenue of \$30 to \$50 million per year. The number of operations over the Grand Canyon was growing, with operations at Grand Canyon National Park Airport increasing 300 percent from 1974 to 1980.

The establishment of large flight-free zones was expected to roughly double the time for Tusayan-based operators to reach the canyon rim. The DOI analysis assumed that these operators could adjust for the increased travel time by increasing the overall tour length and passing on any additional costs to the consumer. While the percent of tour time spent over the canyon would decrease, small price increases or slightly decreased flight time over the canyon was not expected to result in a decreased ridership. In addition, even though Tusayan-based companies would incur costs to modify advertising literature and tour narrations due to route change requirements, the DOI analysis assumed that these costs would likely be part of the normal operating program. The benefits to the park resources (natural quiet, wildlife, archeological features, etc.) and the more than 3,315,000 visitors (about 3 million front-country users and over 90 percent of the 350,000 back-country below rim users each year) would accrue primarily from the increased quiet resulting from noise reduction. Thus, DOI concluded that this NPRM would be cost-beneficial because cost to air tour operators would be minimal and the benefits to park resources and visitors would be significant.

For the purpose of this proposal, the FAA updated the DOI's December 1987 data as follows: (1) There are still 40 to 45 air tour operators; (2) the estimated revenue generated by the industry is now over \$100 million each year; and (3) the number of ground visitors has increased to almost 5 million. The FAA believes that the proposal to extend the current SFAR No. 50-2 would not alter current industry practices in the Grand Canyon special flight rules area and would not affect growth in air traffic. Additionally, the proposal would not cause significant economic impact because it would not change the volume of traffic, the altitude of flight routes, or the noise characteristics of the aircraft typically used in canyon flights between now and 1997. Therefore the FAA has determined that the proposed extension would not result in additional costs to the air tour operators. Since the rule was first promulgated in 1987, the number of

ground visitors increased by 90 percent. During this period, the estimated number of air tour operators remained unchanged, while the estimated revenue generated by the air tour industry has doubled.

#### Initial Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Federal regulations. The RFA requires a Regulatory Flexibility Analysis if a rule will have "a significant economic impact on a substantial number of small entities." FAA Order 2100.14A outlines the FAA's procedures and criteria for implementing the RFA. Small entities are independently owned and operated small businesses and small, not-for-profit organizations. A "substantial number of small entities" is defined as a number that is 11 or more and which is more than one-third of the small entities subject to this direct final rule. The FAA determined that this NPRM will not result in a significant economic impact on a substantial number of small entities.

#### International Trade Impact Assessment

This NPRM is expected to have neither an adverse impact on the trade opportunities for U.S. firms doing business abroad nor on foreign firms doing business in the United States. This assessment is based on the fact that

part 135 air tour operators potentially impacted by this NPRM do not compete with similar operators abroad. That is, their competitive environment is confined to the Grand Canyon National Park.

#### Conclusion

For the reasons set forth above, the FAA has determined that this NPRM is not a significant regulatory action under Executive Order 12866. In addition, the FAA certifies that this NPRM, if adopted, would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This NPRM is not considered significant under DOT Regulatory Policies and Procedures.

#### Paperwork Reduction Act

This notice contains no information collection requests requiring approval of the Office of Management and Budget.

#### List of Subjects in 14 CFR Parts 91 and 135

Aircraft, Air taxis, Air traffic control, Aviation safety.

#### The Amendment

For the reasons set forth above, the Federal Aviation Administration proposes to amend SFAR No. 50-2 (14 CFR parts 91 and 135) as follows:

#### PART 91—(AMENDED)

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

Authority: 49 U.S.C. 1301(f), 1303, 1344, 1348, 1352 through 1355, 1401, 1421 through 1431, 1471, 1472, 1502, 1510, 1522, and 1523 through 1525; Articles 12, 20, 31, and 32(a) of the Convention on International Civil Aviation (49 Stat. 1100); 42 U.S.C. 4321 et seq.; E.O. 11514, 35 FR 4247, 3 CFR, 1966-1970 Comp., p. 907; 49 U.S.C. 106(g).

#### PART 135—(AMENDED)

2. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1355(a), 1421 through 1431, and 1502; 49 U.S.C. 106(g).

3. In parts 91 and 135, Special Federal Aviation Regulation No. 50-2, the text of which appears at the beginning of part 91, is amended by revising Section 9 to read as follows:

SFAR No. 50-2 Special Flight Rules in the Vicinity of the Grand Canyon National Park, AZ

\* \* \* \* \*

Section 9. Termination date. This Special Federal Aviation Regulation expires on June 15, 1997.

\* \* \* \* \*

Issued in Washington, DC, on April 8, 1995.

Harold W. Becker,

Manager, Airports—Rules and Aeronautical Information Division.

(FR Doc. 95-8952 Filed 4-11-95; 8:45 am)

ILLUSTRATION CODE 4910-12-01

**14 CFR Part 91 and 135**

[Docket No. 25149, Notice 95-6; Special Federal Aviation Regulation (SFAR) No. 60-2]

RIN 2120-AF60

**Special Flight Rules in the Vicinity of the Grand Canyon National Park**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM); correction.

**SUMMARY:** This document contains a correction to a Notice of Proposed Rulemaking (NPRM), Special Flight Rules in the Vicinity of the Grand Canyon National Park, SFAR No. 60-2, published in the Federal Register on April 12, 1995 (60 FR 18700).

**FOR FURTHER INFORMATION CONTACT:** Mrs. Ellen Crum, Air Traffic Rules Branch, ATP-230, Telephone (202) 267-8783.

**SUPPLEMENTARY INFORMATION:**

**History**

Federal Register Document, Docket No. 25149, published on April 12, 1995 (60 FR 18700), proposed to extend the effectiveness of SFAR No. 60-2. The Notice No. was omitted from the heading.

**Correction to NPRM**

The NPRM, published in the Federal Register on April 12, 1995 (60 FR 18700), is corrected as follows:

1. By adding the words "Notice 95-6;" on page 18700, first column, in the heading, after "Docket No. 25149,".

Issued in Washington, DC, on May 17, 1995.

Donald P. Byrne,  
Assistant Chief Counsel, Office of the Chief Counsel.

[FR Doc. 95-12753 Filed 5-24-95; 8:45 am]

BLLB90 CC08 4010-10-M

APPENDIX C  
FAA HANDBOOK 8400.10 BULLETIN 92-01

AIR TOUR/SIGHTSEEING OPERATIONS

A. Background. On June 18, 1986, a de Havilland DHC-6, Twin Otter, operated by Grand Canyon Airlines, Inc., under Part 135, collided in mid-air with a Bell Jet Ranger helicopter operated under Part 91 by Helitech, Inc. Twenty-five lives were lost in this mid-air collision accident. Aviation accidents within and around the Grand Canyon and other prominent attractions have heightened public interest in safety of sightseeing and air tour operations.

1. Other patrons of the Grand Canyon and other National Parks have expressed concerns over noise generated by overflying aircraft to their congressional representatives. Environmental lobby organizations have also expressed their concerns for potential environmental damage and harm to natural inhabitants of these areas. Overuse of these areas would not bolster preservation of the area for future generations.

2. Congressional concerns over air safety and aircraft noise resulted in the enactment of Public Law 100-91 on August 18, 1987. This law required a study of aircraft noise effect at a number of national parks. The law also imposed flight restrictions at the following three parks: Grand Canyon National Park in Arizona, Yosemite National Park in California, and Haleakala National Park in Hawaii.

3. To comply with a congressional concern for controlling overflights, the Federal Aviation Administration (FAA) established the "Grand Canyon National Park Special Flight Rules Area." Special Federal Aviation Regulation (SFAR) 50-2 presently governs the airspace in and over the Grand Canyon National Park. SFAR 50-2 expires June 15, 1992.

B. General. Presently, the Grand Canyon is the only national park with special operating rules governing aircraft overflights and requirements for operators conducting sightseeing flights to have Part 135 certification. The special rule, SFAR 50-2, was developed to preserve a fragile natural environment experiencing heavy visitation of many users. The concerns of the National Park Service were to preserve a noise free, safe, and natural environment for the public.

1. The successful development of SFAR 50-2, as an effective enhancement to noise control and safety of air

to conduct Grand Canyon operations should coordinate with the Western-Pacific Regional Office Flight Standards Division.

2. Special regulations that may be developed in the future for another area, park, or prominent attraction, would be identified and any special operational authority would be listed as a note in paragraph B of the OpSpecs. The suggested wording for such an entry would be:

"Special Requirements: Note 1. Air tour/sightseeing operations are authorized to be conducted over "list appropriate area, river or prominent point of interest" in accordance with procedures outlined within the operators operation manual."

3. The routes and altitudes depicted in the operator's OpSpecs should enhance collision avoidance procedures and aircraft noise abatement. The identification of sightseeing areas and routes does not relieve the pilot-in-command from the responsibility to see and avoid other aircraft.

#### E. Operations Manual.

1. Coordination through Western-Pacific Regional Flight Standards with the Las Vegas Flight Standards District Office (FSDO) is required for approval to conduct sightseeing and/or air-tours in the Grand Canyon. Special programs developed through the Las Vegas FSDO are required of the operator to hold opssecs granting flight authority in SFAR 50-2 airspace.

2. For attractions and areas other than the Grand Canyon, POI's should recommend to operators that they have a chapter within their operations manual containing an outline of procedures for conducting air tour/sightseeing operations. This chapter should contain the following:

Air tour/sightseeing area clearly depicted on a chart and explained in words to ensure the reader's comprehension of the tour area.

All tour area entry/exit points should also be points for radio reports on a common-use air-to-air frequency.

A clear description of tour routes, altitudes, and reporting points.

Procedures for obtaining current weather

information and weather deviations. (Higher visual flight rules weather minimums should be considered for flight operations in high density traffic where air tour/sightseeing operators enter and depart special airspace.)

Collateral duties such as the pilot narrating a tour or operating tape players for passengers. (These shall only be performed when the pilot's workload permits; compliance with Section 135.100(b) of the Federal Aviation Regulations is still required.)

- - Provision for additional crewmember training if necessary. Ground and flight training may be required for each additional air tour/sightseeing operation.

F. Program Tracking Reporting Subsystem (PTRS) Input. POI's must record all relevant dialogue with operators regarding air tour/sightseeing operations into the PTRS system. The POI should enter activity code number 1260 in section I and code A 603 in the primary/key column in section IV. The inspector should enter a special entry "AIRTOUR" in the national tracking block.

G. Location in Handbook. The material covered in this handbook bulletin will be incorporated by AFS-553 in future revisions of the Air Transportation Operations Inspector's Handbook 8400.10. Until the new material is incorporated in the handbook inspectors should refer to this handbook bulletin.

H. Inquiries. Any questions regarding this handbook bulletin should be directed to AFS-510 at FTS 698-0366.

# federal register

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Monday  
September 26, 1994

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Part V

Department of  
Transportation

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Federal Aviation Administration

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14 CFR Parts 91 and 135  
Air Tour Operators in the State of  
Hawaii; Final Rule

## DEPARTMENT OF TRANSPORTATION

## Federal Aviation Administration

## 14 CFR Parts 91 and 135

Docket No. 27919; Subject: Federal Aviation Regulation (FAR) Ks. 71

IBN 2150-AFES

## Air Tour Operators in the State of Hawaii

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

**SUMMARY:** This action establishes certain procedural, operational and equipment requirements for air tour operators in the State of Hawaii. This emergency rule is necessary because of an escalation of air tour accidents. The regulation is intended to enhance the safety of air tour operations within the State.

**DATES:** This final rule is effective October 28, 1994. Comments must be received on or before December 27, 1994.

**ADDRESSES:** Send comments on this final rule in triplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-200), Docket No. 27919, 800 Independence Ave., SW., Washington, DC 20591. Comments delivered must be marked Docket No. 27919. Comments may be examined in room 918G weekdays between 8:30 a.m. and 3 p.m., except on Federal holidays.

Commenters who wish the FAA to acknowledge the receipt of their comments must submit with their comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 27919." The postcard will be date stamped by the FAA and returned to the commenter.

**FOR FURTHER INFORMATION CONTACT:** Brian Calendine, Air Transportation Division, AFS-200, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; Telephone (202) 267-8166.

**SUPPLEMENTARY INFORMATION:**

## Availability of Final Rule

Any person may obtain a copy of this final rule by submitting a request to the Federal Aviation Administration, Office of Public Affairs, Attention: Public Information Center, APA-220, 800

Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-3485. Requests should be identified by the docket number of this rule.

Persons interested in being placed on a mailing list for notices of proposed rulemaking should request a copy of Advisory Circular No. 11-2A, "Notice of Proposed Rulemaking Distribution System," which describes the application procedure.

**Background***The Air Tour Industry*

Since 1990, the air tour industry in the State of Hawaii has grown rapidly, particularly on the islands of Oahu, Kauai, Maui, and Hawaii. The growth of the tourist industry, the beauty of the islands, and the inaccessibility of some areas on the islands has generated tremendous growth in the number of air tour flights. In 1992, there were approximately 83,000 helicopter and 11,000 airplane air tour flights. By 1991, these numbers had increased to approximately 101,000 for helicopters and 18,000 for airplanes. After a slight decline due to Hurricane Iniki in 1992, air tour flights in 1994 are projected to reach the 1991 levels. In Hawaii, the air tour industry carries about 400,000 passengers annually. Thirty-eight operators are conducting air tours within the State of Hawaii, using approximately 97 helicopters and 16 fixed-wing aircraft. During the 9-year period between 1982 and 1991, there were eight fatal accidents with 24 fatalities. The accident data shows an escalation of fatal accidents during the 3-year period between 1991 and 1994. During this time, there were five fatal accidents with 24 fatalities. (See table and figure)

*Use of Helicopters in Air Tours*

Helicopters are uniquely suited for air tours in Hawaii because they can operate at slow speeds and hover over scenic areas. Helicopter air tours are often conducted close to the ground, near scenic attractions so passengers can see and experience the thrill of being close to geological and terrain features, such as lava flows and waterfalls.

Some air tour operators advertise dramatic overwater flights to view whales, shorelines, cliffs, and waterfalls; entry into one-way canyons; flying close to hot molten lava; and hovering over the shoreline where molten lava flows

into the ocean. Some advertising brochures, for example, describe air tours as "excitement to the boiling point," and invite tourists to "fly into the heart and heat of an active volcano" and "close enough to waterfalls to feel the cooling mist." One fixed-wing air tour operator formerly advertised that "[w]e fly you lower and slower than any twin engine plane can . . . lower and slower than many helicopters do . . ."

While passengers are often attracted to the thrill associated with low-flying air tours, they are generally not aware of the risks involved. Risks associated with low flying air tour operations include: unpredictable winds that create less stable flying conditions; fewer options to escape unforeseen weather; unmarked or unknown obstructions; less time to select suitable emergency landing areas; increases in pilot workload because of quick stops, rapid turns, and watching for obstructions; inability to be detected by air traffic control radar; inability to conduct two-way radio communication; increased likelihood of ingesting foreign debris, including salt water spray, into the engine; less overall reaction time; and congestion of low flying traffic at scenic locations. Further, many air tours are conducted over scenic areas along rugged coasts, where, in the event of an engine failure, the pilot must ditch in the ocean. A helicopter without flotation devices, unlike most light airplanes, may sink within moments.

*History and Escalation of Accidents*

The growth of the air tour sightseeing industry in Hawaii has been associated with an escalation of accidents. The proximate causes of the accidents range from engine power loss to encounters with adverse weather. Contributing factors to the causes and seriousness of accidents are: operation beyond the demonstrated performance envelope of the aircraft, inadequate preflight planning for weather and routes, lack of survival equipment, and flying at low altitudes (which does not allow time for recovery or forced landing preparation in the event of a power failure).

The following table is a synopsis of selected air tour accidents involving aircraft damage, minor or serious injuries, or fatalities that occurred between September 1992 and September 1994.

## SELECTED AIR TOUR ACCIDENTS IN HAWAII, SEPTEMBER 1982-SEPTEMBER 1994

Date	Type	Part	Location	Injuries	Fatalities
9/2/82	Bell 206-L	135	Lihue	2 serious 3 minor	
4/8/84	Cessna AA-5A	91	Kamuela		4
6/26/85	Aerospalele	135	Kula	6 minor	1
1/1/86	Cessna R172K	135	Kamuela	4 serious	1
5/18/86	Bell 206B	91	Mau	1 serious 1 minor	2
3/28/87	Bell 206B	135	Kona	3 serious 1 minor	1
4/24/87	Cessna 172N	91	Lihue		4
5/29/88	Bell 206B	135	Honolulu	2 minor	
5/20/89	Aerospalele AS350D	135	Waialeale Falls	7 minor	
6/11/89	Beech H18	135	Waipio Valley		
8/19/89	Aerospalele AS350D	135	Volcano	1 serious 6 minor	11
5/5/91	Hughes 369HS	135	Kaunae	3 minor	
6/8/91	Bell 206B	91	Lihue	3 serious 1 minor	
11/9/91	Bell 206B	135	Hilo	1 serious 2 minor	
4/22/92	Beech E185	135	Mount Haleakala		9
9/16/92	Aerospalele AS350B	135	Hana		7
9/21/92	Bell 47	91	Volcano National Park	3 minor	
1/25/93	Fairchild Hiller FH-1100	91	Volcano National Park	1 minor	4
2/23/94	Aerospalele AS350B	135	Volcano National Park	1 serious 1 minor	
3/25/94	Hughes 369D	135	Hawaii National Park		
4/18/94	Hughes 369D	135	Waimea	4 serious	1
7/14/94	Aerospalele AS350D	135	Hanalei		3
7/14/94	Aerospalele AS350D	135	Molokai		
8/11/94	Aerospalele AS350D	135	Waipio Valley		
9/3/94	Hughes 369D	135	Hilo		

The table shows a total of 24 air tour fatalities between 1982 and 1994 (9 years). Even though there was a decline in the number of air tour flights in 1992, the accident data show an escalation of fatal accidents between 1991 and 1994.

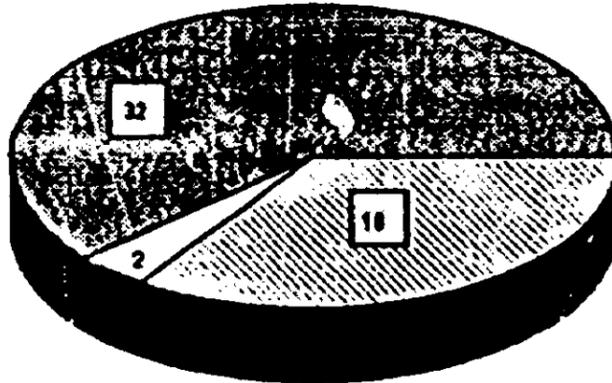
From July 1991 through July 1994 (3 years), there were 20 air tour accidents involving 24 fatalities. (See figure.) Since January 1993, three helicopter accidents have involved landings in the ocean with two of those accidents

resulting in seven fatalities. The most recent fatal accident occurred on July 14, 1994. The most recent non-fatal accident occurred on September 3, 1994. (See table.)

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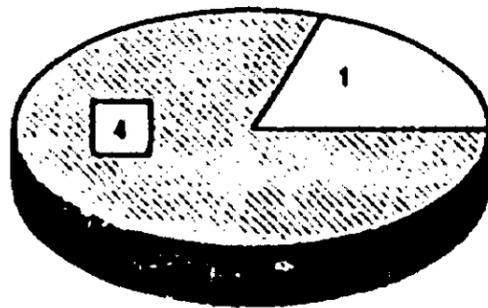
### HAWAIIAN AIRCRAFT ACCIDENT ANALYSIS JULY 1991 THROUGH JULY 1994

Total Aircraft Accidents 52



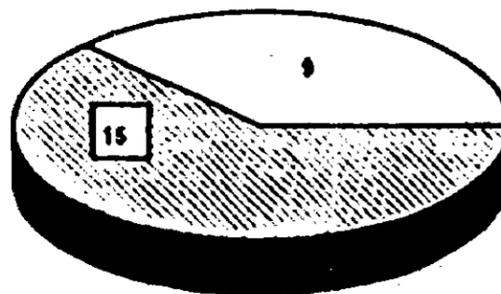
-  Helicopter Air Tour
-  Airplane Air Tour
-  Other than Air Tour (all categories)

Fatal Air Tour Accidents 5



-  Helicopter
-  Airplane

Air Tour Fatalities 24



-  Helicopter
-  Airplane

SOURCE: NTSB

#### National Transportation Safety Board Recommendations

Based on its investigation of the April 22, 1992, accident in Haleakala National Park, the National Transportation Safety Board (NTSB) recommended that the FAA "[c]reate a specific classification for, and operating rules governing, commercial air tour operators based on the complexity of flight operations, aircraft flown, flight frequency, number of passengers carried, air traffic densities in the area of operation, and other relevant factors" (A-93-8). In addition, the NTSB recommended that the FAA "[i]dentify airspace which warrants special protection due to air tour operations," and "[c]reate special operating rules for such airspace to reduce the potential for mid-air collisions and other accidents commensurate with meteorological and terrain considerations." (A-93-10) In response to the NTSB's recommendations, the FAA has informed the NTSB that it is considering a special rule for air tour operators in Hawaii.

Based on the NTSB recommendations, accident investigations, and discussions with the NTSB, the FAA has identified the following as needing to be addressed:

- (1) Air tour operators fly too close and too low to various attractions and land features.
- (2) There is no clear definition of "suitable landing site" for helicopters.
- (3) Sightseeing helicopters are operating in the avoid area of the height-speed envelope (deadman's curve) where successful autorotations are not possible.
- (4) Helicopters operating along the shorelines of the Hawaiian Islands should be equipped with appropriate flotation equipment.
- (5) Passengers should be briefed before flights on the use of flotation gear.

#### Actions Other Than Rulemaking to Address the Problems

The FAA, the State of Hawaii, and the air tour industry have been attempting to correct safety problems that affect air tour operations.

In 1986, the FAA conducted a study of helicopter sightseeing operations in Hawaii. The study team was composed of representatives from the FAA, the State of Hawaii, and industry. Based on the study, recommendations were made to the State and to operators in Hawaii to improve safety and community relations. Recommendations included the following:

- (1) The FAA should study the possibility of imposing limitations,

through operations specifications, that would require the helicopter to be operated at a combination of height and forward speed (including hover) that would permit a safe landing in event of engine power loss, in accordance with the height-speed envelope for that helicopter under current weight and aircraft altitude. These limitations would also prevent the helicopter from being flown over areas in which a safe forced landing could not be made.

(2) The FAA should advise helicopter operators who conduct passenger-carrying operations under part 91 or part 135 that a flight (1) over an area in which a successful forced landing could not be made, or (2) at an airspeed and altitude combination that places the aircraft beyond its performance capability to successfully autorotate, would be considered a reckless operation under § 91.13 (formerly § 91.9).

The study team was also concerned about the lack of helicopter flotation equipment on some aircraft, particularly for operations along the coastlines of the islands, where cliffs and rocks make a successful autorotation to shore virtually impossible. The team believes that the shoreline must offer a reasonable chance to land safely in the event of engine failure, and that, if no such area exists, appropriate helicopter flotation equipment should be required.

Also, in 1986, the FAA conducted a joint study with the State of Hawaii on helicopter heliport and airport access. A result of that study was the Helicopter Operating Plan for Hawaii. Based on portions of that plan, the Hawaiian Helicopters Operators Association (HHOA) developed its "Fly Neighborly" program. The HHOA plan calls for voluntary compliance with a standoff distance of 1,500 feet and a minimum altitude of 1,500 feet over communities. In addition, the plan calls for a 3,000-foot standoff distance in areas of Volcanoes National Park. The HHOA program includes part 91 operators as well as part 135 certificated operators. This is a voluntary program without FAA oversight.

On January 17, 1992, the FAA issued Handbook Bulletin No. 92-01, Air Tour/Sightseeing Operations. The bulletin advises principal operations inspectors to recommend to operators that they include procedures in their operations manuals for conducting air tour/sightseeing operations. The bulletin also advises the inclusion of charts of air tour areas, procedures for obtaining current weather, provisions for pilot training, and other information specific to air tour operations.

In January 1994, the FAA held four public meetings in Hawaii to investigate complaints regarding flight safety, aircraft noise, and possible intrusive flights of helicopters. While the vast majority of the commenters addressed the noise issue, some commenters did raise safety issues. Some of the public meeting comments and subsequent comments submitted to the FAA highlight a number of personal experiences of individuals who witnessed helicopters flying dangerously low over scenic areas and above people and property on the ground. In some instances, witnesses claimed that the aircraft flew lower than the people who were walking on high elevation trails.

The Honolulu Flight Standards District Office, during the past 3 years, has conducted an extensive inspection and surveillance program of the air tour industry. On July 15, 1994, in response to a number of recent accidents, the FAA initiated a comprehensive review of operations and maintenance practices of the Hawaiian air tour operators. In addition, the FAA requested that all air tour operators in the State of Hawaii immediately conduct a "stand down" safety review of their operational and maintenance practices.

#### Need for Emergency Rulemaking

Despite the voluntary measures, the cooperation of the Hawaii air tour operators, and the FAA's inspections, the accident data show that additional measures are necessary to ensure safe air tour operations in Hawaii. The current regulatory scheme is not comprehensive enough to ensure the safety of all air tour operations in Hawaii.

Section 91.119 prescribes minimum altitudes for airplanes and helicopters that provide for the protection of persons and property on the surface. Generally, a pilot may not operate below an altitude allowing, if power failure occurs, an emergency landing without undue hazard to persons or property on the surface. Helicopters may be operated at lower altitudes than airplanes if the operation is conducted without hazard to persons or property on the surface and the pilot can conduct a safe emergency landing in the event of power failure.

Under ideal conditions, a helicopter, unlike an airplane, can land at or near zero forward speed, provided the landing area is relatively level and free of obstructions. Factors that make an emergency landing site unsuitable include obstacles, rugged terrain, congested areas and water. Obstacles range from natural terrain features and

trees to buildings and utility towers with wires strung between them.

A major factor affecting safety of flight in any single engine aircraft at low altitude is the limited choice of suitable emergency landing areas. Hawaii's unique topography—active volcanoes spewing hot molten lava, sharp cliffs, cascading waterfalls, rugged coastlines, mist-shrouded mountains, dense tropical rainforests and deep, closed canyons—often complicates access to suitable emergency landing areas. The air tour accidents in Hawaii indicate that helicopter pilots have had insufficient time to locate suitable landing areas after engine power loss or other problems leading to accidents.

Based on the recent escalation of accidents caused by unsafe operating practices, and the fact that voluntary measures are insufficient, the FAA is implementing this emergency final rule as Special Federal Regulation (SFAR) No. 71.

#### *The Special Federal Aviation Regulation*

The FAA is promulgating these requirements in an SFAR, rather than a general rule, to address the unique problems associated with the Hawaiian air tour operating environment.

This emergency regulatory action establishes additional operating procedures, including minimum safe altitudes (and associated increases in visual flight rules (VFR) weather minimums), minimum equipment requirements, and operational limitations for air tour aircraft in the State of Hawaii.

#### *Applicability and Definitions*

This SFAR applies to parts 91 and 135 air tour operators in the State of Hawaii (section 1). In section 2, "air tour" is defined as any VFR sightseeing flight conducted in an airplane or helicopter for compensation or hire. "Air tour operator" is defined as any person who conducts an air tour.

#### *Flotation Devices*

The SFAR requires that any single-engine air tour helicopter flown beyond the shore of any island must be amphibious or equipped with emergency floats and approved flotation gear easily accessible for each occupant, or that each person on board the helicopter wear approved flotation gear. An amphibious helicopter or one equipped with floats will allow a safe emergency ditching. This requirement is specific to helicopters because helicopters, unlike airplanes, may sink rapidly after forced landings on water.

These requirements should reduce the risk of drowning, such as the deaths that

occurred on January 25, 1993, when a helicopter, operating under part 91, crashed in deep water while on a sightseeing flight to view molten lava flowing into the ocean off the coast of Volcanoes National Park. Before the accident, the pilot had been hovering near the shoreline between 100 and 150 feet above sea level. When the pilot attempted to resume forward flight, he experienced a total left pedal failure. The pilot lost control and the helicopter landed in the ocean and sank. The helicopter was not equipped with flotation devices, and the pilot and four passengers were not wearing lifevests. Only the pilot survived. The NTSB found that a factor which contributed to the passengers' fatal injuries was the operator's failure to provide lifevests to the passengers.

In a July 14, 1984, accident, an air tour helicopter with seven people on board made a forced landing in the Pacific Ocean after losing power off Kauai's Na Pali Coast. Three passengers swam to shore and another was rescued from the water. The pilot and two other passengers drowned. The helicopter was not equipped with flotation devices, and the passengers did not have sufficient time to don the lifevests on board the helicopter.

Later, on the same day, a different air tour helicopter made a forced landing after losing power off the north coast of Molokai. All persons aboard the helicopter swam to shore and were rescued the next day. The helicopter was equipped with flotation devices, and the pilot and passengers had sufficient time to don the lifevests.

Flotation equipment on a helicopter should allow the helicopter to remain afloat long enough for the persons to egress safely; the individual flotation gear should allow the survivors an opportunity to swim to shore or to be picked up by rescue personnel. Flotation equipment/lifevests helped to ensure the survival of the passengers in the second accident on July 14.

The FAA is considering changing the rule to require that all single-engine helicopters conducting air tour operations beyond the shore of any island be amphibious or fitted with flotation devices. Therefore, the FAA is requesting comments on this possibility. At the close of the comment period, the FAA will analyze the comments received and, based on its analysis, determine if further rulemaking is necessary.

#### *Helicopter Performance Plan*

Section 4 requires that, before departure, the air tour operator must complete a performance plan for the

helicopter flight. The pilot in command (PIC) is required to comply with the performance plan. The plan must be based on information in the rotorcraft flight manual (RFM), considering the maximum density altitude to which the operation is planned and must address such elements as maximum gross weight and center of gravity, maximum gross weight for hovering in or out of ground effect, and maximum combination of weight, altitude, and temperature for which height-velocity information in the RFM is valid. This requirement is necessary in light of accidents attributable to the failure of the pilot to stay outside the avoid area of the helicopter height-velocity envelope. The flight is not limited to the out-of-ground effect (OGE) ceiling, and the helicopter may be operated at a higher altitude provided no hovering is planned.

This requirement should enhance flight safety in light of certain accidents, including that which took place on May 20, 1989. On that date, an Aerospatiale AS350D was on a local sightseeing flight to view Waialeale Falls with six passengers on board. After hovering at a low altitude near the falls, the pilot began a pedal turn and forward movement for the initial climb away from the falls. The main rotor revolutions per minute (rpm) decayed, and the pilot turned back toward the upper falls, where he thought he could land. However, the helicopter settled into a ravine, damaging the helicopter and injuring the pilot and passengers. The NTSB determined that the probable cause of the accident was the pilot's failure to maintain rotor rpm, while turning and taking off from a hover with a relatively heavy gross weight. Additional factors related to the accident were the high density altitude and rough/uneven (rocky) terrain in the emergency landing area.

#### *Helicopter Operating Limitations*

Section 5 requires that the PIC shall operate the helicopter at a combination of height and forward speed (including hover) that would permit a safe landing in the event of engine power loss, in accordance with the height-velocity envelope for that helicopter under current weight and aircraft altitude. This requirement is necessary to prevent pilots from hovering for periods of time beyond the performance capability of the helicopter and outside what the height-velocity diagram permits for safe operation.

This requirement prohibits aircraft from being operated in dangerous flight regimes, such as the January 25, 1993, accident discussed previously (when

the pilot was hovering at a low altitude over a lava flow). It also is intended to prevent the type of accidents that occurred on March 25, 1994, and April 18, 1994. On March 25, 1994, the pilot of a Hughes 369D helicopter operated under part 135 lost control and collided with mountainous terrain by the Puu'oo Vent in Hawaii National Park. The helicopter had become enveloped in a steam cloud at a 40-foot hover just before the pilot lost control. The helicopter was destroyed; the pilot and passengers sustained minor injuries. On April 18, 1994, a Hughes 369D helicopter lost power during an OGE hover and collided with rocky terrain below Waimea Falls, Waimea, Kauai. The helicopter was on a sightseeing flight operated under part 135. The pilot and three passengers were seriously injured. One passenger was fatally injured.

The requirement increases the possibility of safe landing in the event of engine failure. A safe landing may not be possible if the helicopter is within the avoid area of the height-velocity envelope when the engine failure occurs.

#### Minimum Flight Altitudes

Section 6 requires that, unless operating in compliance with an air traffic control clearance, or as otherwise authorized by the Administrator, air tour operations may not be conducted below an altitude of 1,500 feet above the surface; and closer than 1,500 feet from any person or property; or below any altitude provided by Federal statute or regulation. As noted earlier, Hawaii's unique topography often complicates access to suitable emergency landing areas. The air tour accidents in Hawaii have been characterized by insufficient time for pilots to locate suitable landing areas after engine power loss or other problems leading to accidents. The requirement to maintain an altitude of 1,500 feet above the surface is necessary for safety because it allows the pilot sufficient time to react in an emergency, to notify and instruct passengers, and to prepare for a forced landing. An aircraft operating at least 1,500 feet above the surface allows the pilot a greater opportunity to select a suitable landing site than would be the case at lower altitudes. The FAA notes that these minimum distances are consistent with NHOA's Fly Neighborly program.

The accident data also show low-flying aircraft flying VFR into instrument meteorological conditions (IMC). An additional benefit from the 1,500-foot minimum altitude will be the increased basic VFR weather minimums for these air tour operations. This

provision is necessary in light of the numerous accidents that have occurred when the aircraft flew into terrain because of low visibility or because the pilot was flying too low. The accident data show that this is a problem for both airplanes and helicopters. For instance, on April 24, 1987, an air tour flight operated under part 91 collided with terrain in the Waimea Canyon. Marginal visual meteorological conditions were reported in the vicinity of the accident site. The pilot and three passengers were fatally injured. In the January 25, 1993, accident, in which the helicopter crashed in deep water after hovering between 100 and 150 feet above sea level, the NTSB noted that a contributing factor to the accident was the pilot's choice of a hover altitude/position inadequate to reach a shoreline in the event of an emergency.

On June 11, 1989, a Beechcraft BE-H18, operating under part 135 on a sightseeing flight, crashed near a waterfall in the Waipio Valley of the Kohala Mountains on the island of Hawaii. After filing a VFR flight plan, the pilot had departed Hilo International Airport for Maui. The pilot entered a closed canyon and ultimately impacted the canyon wall 600 to 900 feet below the rim. The pilot and 10 passengers were fatally injured, and the airplane was destroyed by impact forces and postcrash fire. The NTSB determined that the probable cause of the accident was the pilot's improper decision to maneuver with insufficient altitude in a canyon area.

On April 22, 1992, a Beechcraft E-18S operating on a VFR air tour flight collided with mountainous terrain in Haleakala National Park in an area where fog had reduced visibility around the mountain top. The FAA had provided a full weather briefing to the pilot, including an advisory that VFR flight was not recommended over the interior sections of all islands, and a forecast indicating isolated areas of 3 miles visibility due to haze and moderate rain showers. The aircraft was destroyed, and the pilot and eight passengers were killed. Weather reports and witness statements indicate that IMC existed in the area at the time of the accident. The NTSB determined that the probable cause of this accident was the pilot's decision to continue visual flight into IMC that obscured rising mountainous terrain and his failure to use properly available navigational information to remain clear of the island.

On September 16, 1992, an Aerospatiale AS-350B departed on a sightseeing flight even though adverse weather conditions including

thunderstorms, rain showers, and poor visibility were reported. A witness reported rain showers and mountain obscuration about the time of the accident. He stated that he saw a helicopter flying in and out of clouds and stated that he could not understand why a helicopter would be flying so close to the mountains given the adverse weather conditions. The NTSB determined that a probable cause of the accident, which involved seven fatalities, was the pilot's in-flight decision to continue VFR flight into adverse weather conditions. A factor in the accident was the pilot's inability to see and avoid the mountainous terrain due to the thunderstorms.

#### Briefing Passengers

Section 7 contains the requirement that passengers be briefed (in addition to §§ 91.102 and 135.117) before takeoff for an air tour flight with a flight segment beyond the ocean shore of any island. The briefing shall include information on water ditching procedures, use of personal flotation gear, and emergency egress from the aircraft. The PIC must orally brief passengers, distribute written instructions, or ensure that passengers have been briefed on emergency procedures. This provision is necessary in light of the flotation equipment requirements set forth in this emergency rule.

#### Related Rulemaking

This SFAR is an emergency final rule addressing air tour operations in the State of Hawaii in light of the increasing frequency of accidents. The FAA is considering other rulemaking action to address noise and other issues concerning sightseeing overflights in national parks and other scenic areas. On March 17, 1994, the FAA and the National Park Service (NPS) issued a joint advance notice of proposed rulemaking (ANPRM) (59 FR 12740) seeking public comment on general policy and specific recommendations for voluntary and regulatory actions to address the effects of aircraft overflights on national parks. The FAA is currently analyzing comments submitted in response to the ANPRM. This SFAR is an emergency rule and not a final action in response to the joint FAA/NPS ANPRM.

The promulgation of requirements and restrictions in this SFAR, including the minimum flight altitude restriction, does not preclude the FAA from revisiting the issues addressed in the SFAR. As mentioned above, changes to this SFAR may be necessitated after a review of the comments received from

related regulatory proposals. Additionally, this SFAR may be amended after consideration of the comments received on this SFAR.

#### *Paperwork Reduction Act*

This rule contains no information collection requests requiring approval of the Office of Management and Budget pursuant to the Paperwork Reduction Act (44 U.S.C. 3507 et. seq.).

#### *Regulatory Evaluation Summary*

##### *Introduction*

Changes to Federal regulations are required to undergo several economic analyses. First, Executive Order 12866 directs each Federal agency to 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, the Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade. With respect to this rule, the FAA has determined that it: (1) is "a significant regulatory action" as defined in the Executive Order; (2) is significant as defined in the DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); (3) will have a significant impact on a substantial number of small entities; and (4) will not constitute a barrier to international trade. Therefore, a full regulatory analysis, which includes the identification and evaluation of cost-reducing alternatives to this rule, has been prepared. This regulatory evaluation summary presents a concise analysis of the costs and benefits associated with the final rule that amends the Federal Aviation Regulations by establishing certain operational, procedural, and equipment requirements for air tour operators in the State of Hawaii.

##### *Costs*

The FAA estimates the total cost of the SFAR to be about \$2.0 million, with a present value of \$1.8 million (7 percent discount rate), from 1995 to 1997. The FAA assumes that air tour operators will elect to have lifevests on board the helicopter rather than installing external flotation gear because the costs are dramatically lower. This present value cost includes the cost of about \$190,000 to provide lifevests on the affected helicopters; the potential of \$1.8 million in lost revenue to air tour operators due to minimum flight altitudes; and \$10,000 for the

development of a helicopter performance plan. Other requirements of the rule—helicopter operating limitations and passenger briefing—will impose little if any cost.

##### *Benefits*

Since 1982, Hawaiian air tour operators have experienced 15 accidents involving at least one serious injury or fatality where the lack of flotation gear, flying into bad weather, or flying low has played a role in the cause of the accident. These accidents have resulted in 48 fatalities and 30 injuries (16 serious and 14 minor). This evaluation divides these accidents into three categories: (1) inadvertent air tour helicopter water landings without flotation gear; (2) air tour helicopter accidents related to flying into bad weather or flying low; and, (3) air tour airplane accidents related to flying into bad weather or flying low.

The potential benefits of preventing all potential sightseeing accidents of a similar nature over the next 3 years totals \$58.8 million, with a present value of about \$52.2 million, of which \$13.7 million would be for the prevention of helicopter accidents and \$18.6 million would be for the prevention of airplane accidents.

##### *Regulatory Flexibility Determination*

The Regulatory Flexibility Act of 1980 (RFA) helps to assure that Federal regulations do not overly burden small businesses, small nonprofit organizations, and airports located in small cities. The RFA requires regulatory agencies to review rules that may have "a significant economic impact on a substantial number of small entities." A substantial number of small entities, defined by FAA Order 2100.14A, "Regulatory Flexibility Criteria and Guidance," is more than one-third, but not less than 11, of the small entities subject to the existing rule. To determine if the rule will impose a significant cost impact on these small entities, the annualized cost must not exceed the annualized cost threshold established in FAA Order 2100.14A.

Small entities potentially affected by the final rule are small on-demand air tour operators in Hawaii using helicopter and fixed-wing aircraft. The FAA assumes that air tour operators will elect to have lifevests on board the helicopter rather than installing external flotation gear because the costs are dramatically lower. The FAA estimates that the annualized cost associated with acquiring lifevests for all helicopter occupants is about \$127 per seat. This estimate incorporates the cost of

purchasing the lifevests, maintenance, and the associated weight penalty. Also, the FAA estimates that the annualized cost of the 1,500-foot minimum altitude requirement is about \$989 per seat. This cost incorporates the estimated lost profits for days when tour operations are prohibited due to inclement weather.

FAA Order 2100.14A defines small on-demand operators as those operating with a fleet of nine or fewer aircraft, which includes 37 (7 fixed-wing and 30 helicopter) of the 38 air tour operators in Hawaii. The annualized cost threshold for small operators is \$4,700 in 1994 dollars. The FAA has determined that the final rule will have a significant economic effect on 6 of the 7 fixed-wing air tour operators and 25 of the 30 affected helicopter air tour operators. The final rule will impose costs greater than the annualized cost threshold of \$4,700 for all affected operators except for six of the small air tour operators.

Due to the significant economic impact of the final rule on a substantial number of small entities, the FAA examined an alternative minimum altitude requirement for the affected operators. The FAA evaluated various minimum altitude requirements including 500, 600, and 1,000 feet so as to reduce the annualized cost of the final rule on individual operators. The FAA has determined that a minimum altitude requirement of 500 feet will be necessary to lower the annualized cost of the final rule below the \$4,700 threshold for most air tour operators. (Under § 91.155, pilots conducting VFR flights more than 1,200 feet above the surface in class G airspace must maintain a 500-foot vertical clearance below the clouds. Pilots operating VFR in class G airspace 1,200 feet or less above the surface must remain clear of clouds.) The FAA estimates that the annualized cost of a 500-foot minimum altitude requirement is about \$81 per seat. Including the cost of the lifevests, the FAA has determined that the combined cost of the lifevests and the alternative requirement for a 500-foot minimum altitude will lower the annualized cost below the \$4,700 threshold for all fixed-wing air tour operators and 26 of the 30 helicopter air tour operators.

The FAA has evaluated the level of safety for the 1,500-foot minimum altitude requirement in the final rule and that provided by a 500-foot minimum altitude requirement. Although the 1,500-foot minimum altitude requirement has a significant economic impact on a substantial number of small entities, it provides

operational safety superior to that provided by a 500-foot minimum altitude and is necessary in the public interest. With the 1,500-foot minimum altitude, fixed-wing aircraft and helicopters have a longer power off gliding time, and the pilots are better able to select a suitable landing area in the event of a power failure. Hawaii's unique topography often complicates access to suitable emergency landing areas. The air tour accidents in Hawaii have been characterized by insufficient time for pilots to locate suitable landing areas after engine power loss or other problems leading to accidents. Therefore, the additional safety margins at the 1,500-foot minimum altitude should be provided when conducting passenger flights.

#### *International Trade Impact Analysis*

The SFAR will not have any impact on international trade because the affected operators do not compete with foreign operators. The SFAR will not constitute a barrier to international trade, including the export of U.S. goods and services to foreign countries and the import of foreign goods and services to the United States.

#### *Good Cause for Immediate Adoption*

The FAA is implementing this emergency final rule due to the recent escalation of fatal air tour accidents. Despite voluntary measures, the cooperation of the Hawaii air tour operators, and the FAA's inspections, the accident data show that voluntary measures and existing regulations are insufficient to ensure safe air tour operations in Hawaii. The recent accidents discussed above indicate an urgent safety problem that cannot be adequately addressed solely by enforcement of existing regulations. For this reason, I find that notice and public procedure are impracticable and contrary to the public interest. However, interested persons are invited to submit such comments as they desire regarding this SFAR. Communications should identify the docket number and be submitted in triplicate to the Rules Docket address noted above. All communications received on or before the close of the comment period will be considered by the Administrator, and this SFAR may be changed in light of the comments received. All comments will be available, both before and after the closing dates for comments, in the Rules Docket for examination by interested parties.

#### *International Civil Aviation Organization and Joint Aviation Regulations*

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with the Standards and Recommended Practices of the International Civil Aviation Organization to the maximum extent practicable. The FAA is not aware of any differences that this amendment will present.

#### *Federalism Implications*

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this regulation will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

#### *Conclusion*

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Analysis, the FAA has determined that this regulation is a significant regulatory action under Executive Order 12866. In addition, the FAA certifies that this regulation will have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This regulation is considered significant under DOT Regulatory Policies and Procedures. A final regulatory evaluation of the regulation, including a Regulatory Flexibility Determination and Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

#### *List of Subjects*

##### *14 CFR Part 91*

Aircraft, Airmen, Aviation safety.

##### *14 CFR Part 135*

Air taxi, Aircraft, Airmen, Aviation safety.

#### *The Amendment*

In consideration of the foregoing, the Federal Aviation Administration amends parts 91 and 135 of the Federal Aviation Regulations (14 CFR parts 91 and 135) 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, and 2121 through 2125; Articles 12, 20, 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).

#### **PART 135—AIR TAXI OPERATORS AND COMMERCIAL OPERATORS**

2. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. app. 1354(a), 1355(a), 1421 through 1431, and 1502; 49 U.S.C. 106(g).

3. In parts 91 and 135, Special Federal Aviation Regulation No. 71, the text of which will appear at the beginning of part 91, is added to read as follows:

#### **SFAR No. 71—Special Operating Rules for Air Tour Operators in the State of Hawaii**

**Section 1. Applicability.** This Special Federal Aviation Regulation prescribes operating rules for airplane and helicopter visual flight rules air tour flights conducted in the State of Hawaii under parts 91 and 135 of the Federal Aviation Regulations. This rule does not apply to flights conducted in gliders or hot air balloons.

**Section 2. Definitions.** For the purposes of this SFAR:

"Air tour" means any sightseeing flight conducted under visual flight rules in an airplane or helicopter for compensation or hire.

"Air tour operator" means any person who conducts an air tour.

**Section 3. Helicopter flotation equipment.** No person may conduct an air tour in Hawaii in a single-engine helicopter beyond the shore of any island, regardless of whether the helicopter is within gliding distance of the shore, unless:

(a) The helicopter is amphibious or is equipped with floats adequate to accomplish a safe emergency ditching and approved flotation gear is easily accessible for each occupant; or

(b) Each person on board the helicopter is wearing approved flotation gear.

**Section 4. Helicopter performance plan.** Each operator must complete a performance plan before each helicopter air tour flight. The performance plan must be based on the information in the Rotorcraft Flight Manual (RFM), considering the maximum density altitude for which the operation is

planned for the flight to determine the following:

(a) Maximum gross weight and center of gravity (CG) limitations for hovering in ground effect;

(b) Maximum gross weight and CG limitations for hovering out of ground effect; and,

(c) Maximum combination of weight, altitude, and temperature for which height-velocity information in the RFM is valid.

The pilot in command (PIC) must comply with the performance plan.

**Section 5. Helicopter operating limitations.** Except for approach to and transition from a hover, the PIC shall operate the helicopter at a combination of height and forward speed (including hover) that would permit a safe landing in event of engine power loss, in

accordance with the height-speed envelope for that helicopter under current weight and aircraft altitude.

**Section 6. Minimum flight altitudes.** Except when necessary for takeoff and landing, or operating in compliance with an air traffic control clearance, or as otherwise authorized by the Administrator, no person may conduct an air tour in Hawaii:

(a) Below an altitude of 1,500 feet above the surface over all areas of the State of Hawaii, and,

(b) Closer than 1,500 feet to any person or property; or,

(c) Below any altitude prescribed by federal statute or regulation.

**Section 7. Passenger briefing.** Before takeoff, each PIC of an air tour flight of Hawaii with a flight segment beyond the ocean shore of any island shall ensure

that each passenger has been briefed on the following, in addition to requirements set forth in § 91.107 or 135.117:

(a) Water ditching procedures;

(b) Use of required flotation equipment; and

(c) Emergency egress from the aircraft in event of a water landing.

**Section 8. Termination date.** This Special Federal Aviation Regulation expires on October 28, 1997.

Issued in Washington, DC, on September 22, 1994.

David R. Hinson,

Administrator.

[FR Doc. 94-23840 Filed 9-22-94; 11:42 am]  
GALING CODE 4914-12-01

APPENDIX E  
Safety Board Letter to Docket Regarding SFAR 71



Office of the Chairman

National Transportation Safety Board

Washington, D.C. 20584

OCT 27 1994

Federal Aviation Administration  
Office of the Chief Counsel  
Attention: Rules Docket (AGC-200), Docket No. 27919  
800 Independence Ave., S.W.  
Washington, D.C. 20591

31 OCT 27 1994

OFFICE OF THE CHIEF COUNSEL  
20584

Dear Sir:

The National Transportation Safety Board has reviewed the Special Federal Aviation Regulation (SFAR) No. 71, "Air Tour Operators in the State of Hawaii," Final Rule, published in 59 FR 49138 on September 26, 1994. The following comments pertain to the subject Docket No. 27919.

National Transportation Safety Board investigations of air tour accidents since 1986 indicate that the existing regulations do not provide an adequate level of safety for air tour operations conducted within the United States. The Safety Board has held two public hearings (1986 and 1994) and as a result made numerous safety recommendations to the FAA in an attempt to define and quantify the national air tour industry and to examine air tour industry safety performance as part of a traditional flight hours-based incident/accident record. FAA actions to date have produced two SFARs that affect the air tour industry.

SFAR 50-2, originally issued in 1988, dictates special flight rules for all aircraft operating within airspace designated as the Grand Canyon National Park Special Flight Rules Area. Testimony by Grand Canyon air tour operator associations at the most recent public hearing conducted at Phoenix, Arizona, on October 11, 1994, indicated that, although there was initial operator resistance to the early FAA efforts to provide route structure and altitude restrictions for VFR air traffic in the area of the Grand Canyon National Park, the current special operating rules have resulted in a more workable and safer air operations environment in the Grand Canyon airspace. This attitude appeared to prevail among the air tour operators; in addition, SFAR 50-2 was reported to be satisfactory to transit commercial operators and general aviation airspace users. Public hearing witnesses testified that the SFAR came into being as the result of 18 months of participative discussions and negotiations between the FAA and parties concerned with the use of the Grand Canyon airspace.

The Safety Board is pleased to recognize the initiative of the FAA to improve air tour safety with the issuance on September 22, 1994, of SFAR No. 71, "Special Operating Rules for Air Tour Operators in the State of Hawaii." Several of the provisions of SFAR 71 will provide an immediate improved level of safety for the Hawaiian air tour industry. However, the Safety Board must reiterate that a permanent nationwide policy for air tour operations is appropriate to define the industry, track its performance, and ensure equal treatment regardless of the points of tourist interest or the location of the operator.

In particular, the Safety Board favorably notes that, within the State of Hawaii, the FAA now defines an air tour operator and provides specific flotation requirements for single-engine helicopter air tour operations, and specifies added requirements for air tour passenger briefings.

During a public hearing on air tour safety conducted in Honolulu, Hawaii, on October 13-14, 1994, the Safety Board received testimony from three Hawaiian air tour company spokespersons. All three operators related that, in light of previous accidents, they considered it appropriate that each person on board their company aircraft should wear approved life preservers. The operators' opinions were supported by helicopter manufacturers' testimony based on historical experience, indicating that emergency water entry frequently results in difficult egress from an overturned aircraft. They indicate that the most beneficial item of survival equipment in this situation is an individual life preserver.

The operators and manufacturers expressed several concerns about the capabilities of airframe-mounted helicopter flotation systems to provide a reliable means of passenger and crew survival. They pointed out that an emergency water entry may easily exceed the certificated vertical speed values of current systems and result in failure of this equipment to fully perform as expected.

Therefore the Safety Board believes that the SFAR 71 provision in Section 3, "Helicopter flotation," should be modified to provide for two redundant means of occupant survival: airframe-mounted flotation equipment and the wearing of a life preserver by each person while on board.

Public hearing testimony on the aspects of the SFAR 71 related to Section 5, "Helicopter operating limitations" and Section 6, "Minimum flight altitudes" was profuse. FAA witnesses indicated that the provisions were based on a review of previous accident data and the FAA's desire to increase the possibility of a successful (noninjury) autorotation or forced landing in the event of an inflight emergency. The Safety Board believes that reasonable measures to improve the successful termination of any

inflight emergency should be evaluated and adopted if appropriate. However, operator comment on the stated SFAR 71 provisions brought several complicating facts to light.

During the public hearing, the Safety Board heard the operators and manufacturers question whether helicopter operating limitations should be placed solely on air tour operators in Hawaii, while nontour operations in Hawaii and operators in other States remain unregulated. The Safety Board believes that the FAA should conduct further discussions with the interested parties to resolve the issue of helicopter height-velocity diagram performance and provide for an equivalent level of safety.

The element of SFAR 71 that presents the Safety Board with the most concern is Section 6, "Minimum flight altitudes." The Safety Board supports the premise of operating at an altitude no lower than that which will allow sufficient time for the pilot to select a suitable landing site and prepare the aircraft and passengers for an emergency landing. However, the Safety Board believes that the SFAR 71 provision that, "no person may conduct an air tour in Hawaii below an altitude of 1,500 feet above the surface of the State of Hawaii or closer than 1,500 feet to any person or property (or as authorized by the Administrator)," may present midair collision hazards or encounters with cloud layers that are more serious than the hazards of flights at lower altitudes.

Public hearing testimony in Honolulu made it obvious that the minimum height above terrain requirement of 1,500 feet will initially concentrate air tour traffic at that flight altitude. Operators should be expected to negotiate cooperative solutions to the concentration of air traffic, but their efforts need to be facilitated by the FAA. Furthermore, weather patterns around the Hawaiian islands should be a major factor in setting any minimum altitude for air tour operations. The orographic effect of changing windward and leeward air flow produces cloud formations along tour routes that must be considered when defining altitude requirements. The Safety Board believes that air traffic concentration presents a matter that must be resolved at the earliest possible time. Furthermore, based on the Safety Board's observations of recent air tour flights throughout the State of Hawaii, the Safety Board believes that weather factors, in combination with the proposed altitude restrictions, will present a serious impediment to the successful completion of air tour flights and may lead to increased operating time over water, difficult regulatory surveillance and enforcement, and could possibly lead to willful disregard for FAA flying regulations.

The Safety Board believes that the air tour operators in Hawaii are in a position to make significant contributions to the improvement of their industry similar to the way in which SFAR 50-2 was developed for the Grand Canyon. Safety Board public hearing testimony indicated that Hawaiian operators recognize that safety

can be improved with modifications of flightpaths and minimum flight altitudes. It was also clear from the public hearing that the flying environment in the Grand Canyon is dissimilar, in many ways, from operations in Hawaii. The Safety Board believes that it is imperative that the FAA conduct further discussions with the interested parties in Hawaii to resolve the issue of optimum flight altitudes for air tour operators and, at the same time, consider the negative effects of such restrictions that may result in unintended degradation of the existing level of safety.

The Safety Board is continuing its investigation of air tour operations in the United States, with emphasis on accidents in Hawaii, and appreciates the opportunity to comment on this final rule.

Sincerely,

  
Jim Hall  
Chairman

**END  
FILMED**

DATE:

**9-8-95**

**NTIS**

