Flight into terrain, Big Island Air flight 58, Piper PA-31-350, N411WL, near Volcano, Hawaii, September 25, 1999

Micro-summary: **This Piper PA-31-350 crashed into the Mauna Loa volcano during a sightseeing flight.**

Event Date: **1999-09-25 at 1726 Hawaiian standard time**

Investigative Body: **National Transportation Safety Board (NTSB), USA**

Investigative Body's Web Site: **http://www.ntsb.gov/**

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National Transportation Safety Board
Washington, D.C. 20594

Aircraft Accident Brief

Accident No.:	DCA99MA088
Operator/Flight Number:	Big Island Air flight 58
Aircraft and Registration:	Piper PA-31-350, N411WL
Location:	near Volcano, Hawaii
Date:	September 25, 1999

HISTORY OF FLIGHT

On September 25, 1999, about 1726 Hawaiian standard time,[1] Big Island Air flight 58, a Piper PA-31-350 (Chieftain), N411WL, crashed on the northeast slope of the Mauna Loa volcano[2] near Volcano, Hawaii. The pilot and all nine passengers on board were killed, and the airplane was destroyed by impact forces and a postimpact fire. The sightseeing tour flight was operating under 14 *Code of Federal Regulations* (CFR) Part 135 as an on-demand air taxi operation. A visual flight rules (VFR) flight plan was filed, and visual meteorological conditions (VMC) existed at the Keahole-Kona International Airport (KOA), Kona, Hawaii, from which the airplane departed about 1622. The investigation determined that instrument meteorological conditions (IMC) prevailed in the vicinity of the accident site.

A Big Island Air employee who observed the pilot upon his arrival at KOA shortly before 0700 on the day of the accident stated that the pilot appeared to be alert and well rested. The pilot was scheduled to make two air taxi flights that day. The morning sightseeing flight departed about 0700, and the second (accident) flight departed about 1622.

The morning's weather report was included on the "Flight Plans and Weather" form that Big Island Air pilots typically reference before flying with an indicated time of about 0700. Big Island Air's Director of Operations (DO) reported to National Transportation Safety Board investigators that he had obtained this weather information from the Federal Aviation Administration's (FAA) Honolulu Automated Flight Service Station (AFSS). No evidence exists to indicate that the pilot sought or obtained an updated weather briefing for the accident flight later that afternoon as required by the FAA.

[1] Unless otherwise stated, all times in this report are Hawaiian standard time based on a 24-hour clock. The investigation determined that sundown occurs about 1754.

[2] The 10,100-foot mean sea level (msl) elevation accident site was located about 7.5 nautical miles (nm) east-northeast from the 13,333-foot peak of the Mauna Loa volcano.

The pilot departed KOA about 1622 for his second sightseeing tour of the day and followed a half-island tour route. (For more information about the half-island tour route, see the Additional Information section of this report.) About 1720, the pilot requested permission from the Honolulu AFSS to transition through a restricted area of airspace (R-3103) that encompasses part of the center of the saddle area.[3] The pilot was advised by AFSS that the restricted area was "open," and he was authorized to transition the area for the next 30 minutes. The FAA did not record any further radio transmissions from the accident pilot.

According to FAA-recorded radar data, at 1721:04, the accident airplane was located approximately 16 nms east-southeast from the eastern side of the restricted area (about 8.5 nms from the crash site). The accident airplane's altitude, as transmitted by its Mode C-equipped transponder, was about 6,600 feet, and the underlying terrain's elevation was about 4,600 feet msl. Both the airplane's altitude and the terrain's elevation were increasing.

Between 1721:04 and the last recorded radar return at 1725:29 (when the airplane was within 1/3-mile of the accident site), the airplane's average ground track was approximately 291 degrees, magnetic. During this time, the accident airplane's altitude increased from about 6,600 to 9,600 feet. Several witnesses observed clouds below the 10,000-foot level around the time of the accident. (For more information about weather conditions, see the Meteorological Information section of this report.) About 1726, the accident airplane crashed on the northeast slope of the Mauna Loa volcano at 10,100 feet msl.

PILOT INFORMATION

The pilot held an airline transport pilot certificate with the ratings and limitations of airplane multiengine land and commercial privileges for airplane single-engine land. The pilot was also certified as a ground instructor (advanced and instrument) and a flight instructor for single-engine and instrument airplanes.[4] The pilot's FAA first-class medical certificate was issued on August 14, 1999, with the limitation that the pilot wear corrective lenses. On the medical examiner's reporting form, a notation was made indicating that the pilot did not use medication and that he was "in good health." A background check was performed of the pilot's driving records for the status of his driver's license, accident history, tickets, and alcohol usage occurrences. No pertinent events or occurrences were found.

The Vice President of Big Island Air reported that he first met the pilot in 1987 when he and the pilot were line captains for another air tour company in Hawaii.[5] The Vice President stated that he maintained a professional relationship with the pilot during the ensuing years. The Vice President also stated that, on the basis of his personal knowledge about the pilot's flying background, his accident/incident-free flight record, his extensive flight experience in multiengine airplanes, his PA-31-350 flight time, and his knowledge of Hawaii and its weather patterns, the pilot was hired by Big Island Air on May 3, 1994. No formal preemployment

[3] The saddle area between the Mauna Kea and Mauna Loa volcanoes is valley-like in its topography, with a maximum elevation of about 6,800 feet msl.

[4] The flight instructor certificate was issued in October 1984 and expired in 1995.

[5] The company, Air Molokai, was based in Maui, Hawaii, and is no longer in business.

checks were performed, and none were required, when the pilot was hired. Safety Board investigators reviewed Big Island Air's "Pilot's Monthly Flight Time Report," which revealed that the pilot did not fly the operator's airplanes between September 1, 1998, and August 14, 1999. The operator reported that during this time, the pilot had been studying in Japan.

According to the pilot's flight record logbook, in 1985, 1986, 1988,[6] 1989,[7] 1994,[8] and 1997, the pilot's total flight time was "983.1"; "over 3,000"; "over 5,000"; "over 7,000"; "over 9,000"; and "10,979" flight hours, respectively. In August 1999, the pilot indicated that he had flown a total of 11,500 hours. Big Island Air reported that during the preceding 30 days and 24 hours before the accident, the pilot had flown for 12.8 and 1.4 hours, respectively.

Big Island Air's DO, who provided the pilot with his most recent flight training in August 1999, stated that the pilot did not experience any particular problems during the training. Records indicate that the pilot received flight and ground training on August 15, 23, and 29, 1999. Upon the successful completion of this training, the DO authorized the pilot to assume the duties of pilot-in-command of the PA-31-350 airplane.

The principal operations inspector (POI) for Big Island Air provided records indicating that the pilot had no previous accident, incident, or FAA enforcement history and that no warning letters had been issued against the pilot during at least the previous 3 years. The POI's records, as entered into the Program Tracking & Reporting Subsystem (PTRS), were also reviewed. The PTRS record entry dated August 30, 1999, indicated that the POI had visited the operator and inspected the pilot's records. The POI reported observing that the pilot was lacking 1 hour of required training time. According to the PTRS record, the pilot's training deficiency was corrected "on the spot." On August 30, 1999, the pilot successfully passed a 1-hour, FAA-administered flight test in a PA-31-350, in which he demonstrated his proficiency regarding emergency instrument flight procedures and flying the airplane in VMC. The FAA inspector remarked on the "Airman Competency/Proficiency Check FAR [Federal Aviation Regulations] 135" form that the pilot had completed all Special Federal Aviation Regulations (SFAR) 71[9] requirements satisfactorily. The pilot was not authorized to perform instrument flight rules (IFR) air taxi flights. The POI who had administered the accident pilot's reinstatement check ride stated that during the flight, the pilot performed an instrument landing system approach, demonstrated competency performing unusual attitude recoveries, and performed other maneuvers. The POI indicated that the pilot's flying skill level was good.

The DO reported that he first met the pilot in 1990 and that he had never seen the pilot's personal flight record logbook or an application for employment. He stated that the pilot's hiring had been based, in part, upon his association with Big Island Air's Vice President. According to the DO, the pilot's attention to his duties was satisfactory since he returned to work (in

[6] In 1988, the pilot began working for Panorama and Samoa Air.

[7] In 1989, the pilot was flying for Aloha Island Air.

[8] In 1994, the pilot was flying for Big Island Air.

[9] SFAR 71, "Special Operating Rules for Air Tour Operators in the State of Hawaii," describes additional operating procedures and limitations for air tour operators in Hawaii.

August 1999). The DO evaluated the pilot's skill and proficiency level as being "okay" and described the pilot as "adequate."

The pilot's immediate supervisor, the chief pilot for Big Island Air, indicated that he had never flown with the pilot but that the pilot would not have been retained by Big Island Air had he not satisfactorily passed the company training program and the required FAA flight test.

On September 27, 1999, the Safety Board received correspondence from a passenger who had flown with the accident pilot during a Big Island Air sightseeing tour on September 4, 1999. The passenger's description of the flight route was similar to that of the accident flight. The passenger indicated that during his tour, the pilot had flown in dense clouds that prevented him from being able to see both ahead of and below the airplane. Investigators subsequently viewed photographs taken by the passenger and a videotape made by the passenger during his flight. The tape showed the airplane flying in clouds on several occasions and in different locations throughout the flight.

The pilot lived on the island of Oahu. According to his landlord, the pilot commuted to work by air. The landlord indicated that the night before the accident flight, September 24, 1999, the pilot went to bed about 2100. The landlord also indicated that because the pilot had an early morning flight on September 25, he would likely have arisen about 0400 and then driven to the Honolulu International Airport and flown on a commercial flight to KOA to begin work.

AIRPLANE INFORMATION

The accident airplane, N411WL, was a Piper PA-31-350 (Chieftain), manufactured in 1983 by Piper Aircraft Company. The airplane was owned by and registered to Big Island Air, Inc. The available airplane records indicate that the airframe had accumulated about 4,523.7 flight hours. The airplane was maintained pursuant to an approved aircraft inspection program under the authorization of the company's 14 CFR Part 135 operating certificate.

The left engine was a Lycoming TIO-540-J2BD, serial number (S/N) L-3907-61A, and the right engine was a Lycoming LTIO-540-J2BD, S/N L-796-68A. The accident airplane was equipped with very high frequency omni directional range (VOR) and distance measuring equipment receivers. In addition, Big Island Air reported that the airplane was equipped with a Garmin model 195 control yoke-mounted global positioning satellite (GPS) receiver that could provide pictorial information on its moving map display and indicate the airplane's altitude, location, ground speed, and ground track.

Weight and Balance Information

Big Island Air tour flights are normally begun with the airplane's auxiliary fuel tanks near empty, and the main fuel tanks completely full. Before the accident flight, the pilot signed off on the combined passenger load manifest/weight and balance form, which indicated the customary

fuel distribution load and a total weight at takeoff of 7,304 pounds (lbs).[10] However, the line serviceman who last fueled the accident airplane indicated that before the accident flight, he had "topped off" the auxiliary fuel tanks and pumped 20 gallons of fuel into each of the main tanks. On the basis of this statement, the fuel meter tickets for the two airplane refueling events before the accident flight, and a reconstruction of the airplane's fuel burn during the flight that preceded the accident flight, Big Island Air estimated that upon departure for the accident flight, the airplane's total weight was 7,592 lbs, about 224 lbs over its maximum allowable gross weight. Safety Board calculations based on this departure weight and assuming normal fuel burn rate indicated that at the time of the accident, the airplane's weight was about 7,315 lbs. According to the Board's calculations, no center of gravity limits were exceeded.

Maintenance

A review was performed of the airplane's utilization and discrepancy forms for the period between its last maintenance inspection on August 31, 1999, and the date of the accident. No maintenance discrepancies or corrective actions were noted. The DO indicated that he believed that all equipment in the airplane was functioning normally. Maintenance records indicated that the last progressive inspection, a Phase 6 inspection, had been performed at a recorded time of 4,480 flight hours on August 31, 1999.

METEOROLOGICAL INFORMATION

There is no continuously operating aviation weather reporting facility in the saddle area of the Big Island; only general weather information for the vicinity is available. On the eastern (windward) side of the island, clouds often form over the up-sloping terrain. The skies on the western side of the island are typically clear or have scattered clouds.

Big Island Air employees indicated that the pilot was responsible for obtaining weather information before departure. No one at Big Island Air provided the pilot with weather information for the accident flight, and the FAA has no record of the pilot requesting a weather briefing for either September 25, 1999, flight.

Three U.S. Geological Survey Biological Resources Division employees observed weather conditions about 1.75 miles northeast of the accident site on the eastern slope of the Mauna Loa volcano on September 25, 1999. Two witnesses indicated that about 1445, visibility was 30 to 200 meters and that the sky was "mostly closed" but began clearing about 1630. Later that afternoon around the time of the accident, a column of gray smoke was observed to the southwest. The witnesses indicated that the visibility on the far side of the smoke was "murky"; however, the smoke column was in clear skies. They indicated that the winds were also very low at that time. Another witness indicated that the landscape at the area of the smoke column was not well defined because of the clouds.

[10] The maximum allowable takeoff weight for the accident airplane was 7,368 lbs.

A helicopter pilot who was reportedly on the prescribed route indicated that about 1630, he observed the weather to the north and south of the area near the accident airplane's route. The helicopter pilot reported that to the north of the route, the sky was overcast, with ceilings below 500 feet above ground level (agl). To the south of the route, an overcast cloud layer between 5,000 and 7,000 feet msl extended from the east flank of the Mauna Loa volcano toward the ocean.

Surface Aviation Weather Observations

Hilo International Airport, Hawaii

The closest facility to the accident site that reported aviation weather was the Hilo International Airport, which has a field elevation of 38 feet msl and is located about 63 degrees at 26 nms from the accident location. On September 25, 1999, about 1706, winds were 100 degrees at 11 knots; visibility was 10 miles; sky condition was few clouds at 2,300 feet, scattered clouds at 3,000 feet, broken ceiling at 3,600 feet; temperature was 24 degrees Celsius (C); dew point was 21 degrees C; and altimeter setting was 29.99 inches mercury (hg). About 1753, winds were 110 degrees at 9 knots; visibility was 10 miles; sky condition was few clouds at 2,400 feet, scattered clouds at 3,200 feet, broken ceiling at 4,600 feet; temperature was 24 degrees C; dew point was 21 degrees C; and altimeter setting was 30.01 inches hg.

Keahole-Kona International Airport, Hawaii

The departure airport, KOA, has a field elevation of 47 feet msl and is located about 292 degrees at 35 nms from the accident location. On September 25, 1999, about 1653, wind was 280 degrees at 7 knots; visibility was 10 miles; sky condition was scattered clouds at 7,500 feet; temperature was 28 degrees C; dew point was 20 degrees C; and altimeter setting was 29.94 inches hg. About 1753, wind was 290 degrees at 5 knots; visibility was 10 miles; sky condition was clear; temperature was 27 degrees C; dew point was 20 degrees C; and altimeter setting was 29.96 inches hg.

Non-Aviation Surface Weather Observations

Keaumo, Hawaii, has an elevation of 5,560 feet msl and is located about 107 degrees at 6 nms from the accident location. On September 25, 1999, about 1700, the temperature was 15 degrees C, the relative humidity was 99 percent, and wind was 90 degrees at 2 knots.

The Mauna Loa Observatory has an elevation of 11,140 feet msl and is located about 283 degrees at 6 nms from the accident location. On September 25, 1999, about 1700, the temperature was 8.8 degrees C, wind was calm, and the dew point was -13.9 degrees C. About 1800, the temperature was 10.6 degrees C, wind was 321 degrees at 2 knots, and the dew point was -13.6 degrees C.

Several cameras are located on a 63-foot tower at the Mauna Loa Observatory. Safety Board staff reviewed camera images from cameras facing north, east, and southwest taken at

10-minute intervals around the time of the accident. This camera imagery was available for public viewing on the state of Hawaii and the University of Hawaii Web sites on the day of the accident. (Camera images on the day of the accident were recorded and are attached to the Meteorological Factual Report.) The camera images showed fog conditions in the vicinity of the Mauna Loa Observatory with part of the ridgeline of the volcano visible in several photographs. In addition to the camera imagery that was publicly available on the state of Hawaii and the University of Hawaii Web sites, the University of Hawaii Web site provided additional meteorological information for the Mauna Kea volcano area and current WSR-88D radar depictions from the island, which showed scattered light reflectivity, or mostly clouds.

Airmen's Meteorological Information

Airmen's meteorological information (AIRMET) SIERRA for IFR and mountain obscuration was issued for the Hawaiian area on September 25, 1999, about 1147 (and valid until 1800) and indicated no significant IFR expected. Another AIRMET SIERRA was issued for the Hawaiian area about 1747 (valid until 0000 on September 26) and again indicated no significant IFR expected.

AIRMET TANGO for turbulence was issued for the Hawaiian area on September 25, 1999, about 1147 and indicated temporary moderate turbulence below 12,000 feet over and immediately south through west of mountains for all islands until 1800. Another AIRMET TANGO was issued for the Hawaiian area about 1747 (valid until 0000 on September 26) and indicated no significant turbulence was expected.

No significant meteorological information (SIGMET) was issued for the Hawaiian Islands around the time of the accident.

COMMUNICATIONS

A review of Honolulu AFSS records, including its Daily Record of Facility Operation, air traffic control tapes and associated transcripts, and personnel statements, indicates that all aids to navigation associated with the accident pilot's flight route were in normal operational status during flight. No evidence indicates that any air-to-ground communications or services were provided to N411WL after the pilot's last contact with the AFSS concluded about 1720. No pilots have reported to Safety Board staff that they had heard or established communication with the pilot of N411WL during the accident flight.

WRECKAGE INFORMATION

The airplane was destroyed by impact forces and a severe postimpact fire. The initial point of impact occurred on lava-covered, up-sloping terrain at an approximate elevation of 10,100 feet msl and was measured by GPS to be 19 degrees 30.823 minutes north latitude, 155 degrees 28.790 minutes west longitude. The final crash site was measured by GPS to be 19 degrees 30.862 minutes north latitude, 155 degrees 28.785 minutes west longitude. All of the wreckage was found within an area approximately 150 feet in diameter.

All flight control surfaces and structural components were located with the main wreckage at the accident site. The accident airplane was found inverted with its right wing, empennage, fuselage remains, and both engine nacelles resting on the lava. The main landing gear was retracted, and the oleo struts were extended in their respective gear wells. No indication of in-flight fire was noted. The fuselage was consumed by fire from the nose throughout the airplane to the horizontal stabilizer. No evidence of failures or in-flight malfunctions of the airplane's air/pneumatic systems was found. The electrical systems of the airplane and the cockpit flight instruments, engine instruments, and avionics control heads were destroyed by impact and postimpact fire.

The left engine remained partially attached to its wing and had sustained varying degrees of thermal damage from the postimpact ground fire. The right engine was found attached to its engine mounts, which were deformed aft and inboard. There was no evidence of mechanical malfunction or fire of the left or right engines before the accident. On both engines, the propeller blades were bent in the direction opposite normal rotation. There were rotational scoring signatures at the turbocharger compressor wheel and shrouds of both engines.

The GPS receiver was destroyed; no data could be recovered. No setting or distance information was determined from the fire-damaged navigation receivers or from the VOR receiver. The magnetic compass was also destroyed.

An examination of the airplane's gyroscopic flight instruments revealed that the damage signatures were consistent with the impact having occurred while the airplane's wings were within 10 degrees of level at zero pitch. The airspeed could not be determined because of the destruction of the airspeed indicator.

MEDICAL AND PATHOLOGICAL INFORMATION

The FAA's Toxicology and Accident Research Laboratory manager reported detecting 4.659 ug/ml of phentermine[11] in a specimen of liver. The drug was also detected in urine. No other drugs were found, and no blood specimen was available for analysis.

TESTS AND RESEARCH

Recorded radar data was used to determine the airplane's rate of climb during the latter portion of flight. Taking into account the airplane's gross weight, configuration, and meteorological conditions, a comparison was made between the rate of climb and the projected maximum climb performance as listed in the airplane's FAA-approved Flight Manual Supplement. The airplane's rate of climb during the last 1/2 minute of flight was consistent with the airplane beginning to operate near its maximum (multiengine) climb performance. Radar data indicates that at that point in flight, the airplane's track varied little from its predominately west-northwesterly direction.

[11] Phentermine is a prescription stimulant and diet aid in the same drug class as amphetamine, with potential side effects similar to all drugs in that class, including insomnia, irritability, hyperactivity, personality changes, and extreme fatigue and depression following acute withdrawal.

OPERATIONS AND MANAGEMENT INFORMATION

The Safety Board reviewed the FAA's oversight and surveillance records for Big Island Air for fiscal year 1999. All of the required inspections were reported to be completed, and all observed deficiencies were reported to be corrected. A further review of PTRS and enforcement records for the previous 2 years revealed several findings, and the flight standards district office personnel followed up on the actions. FAA records for Big Island Air revealed no instances of pilots failing to maintain the minimum required distance from clouds during 1998.

ADDITIONAL INFORMATION

The company has three standard flight plans on file with the Honolulu AFSS. Two plans cover flights around the circumference of the Big Island of Hawaii, and one plan covers the roundtrip east-to-west route to the island's opposite shore via the saddle area between the Mauna Kea and Mauna Loa volcanoes. Big Island Air's chief pilot reported that, weather permitting, the pilot would be expected to conduct the tour flight via the established FAA-approved VFR routes.[12] The pilot's standard route for the accident flight would typically have been a circumferential route, flying north from KOA to the Upolu Point at 1,500 feet agl. From the Upolu Point, the pilot would head eastbound along the north shore toward the Hilo area at 1,000 feet agl. From Hilo, the pilot would proceed south toward the Puu Oo vent and then to the summit of Kilauea at the caldera.[13] The pilot would then return to KOA by proceeding around the South Point (southern end of the island) and back to KOA via the western shoreline.

Big Island Air's DO stated that, frequently, pilots do not fly the circumferential route around the entire island as discussed above. Specifically, rather than flying from the Hilo area to KOA via the South Point, pilots sometimes fly back to KOA via the saddle route. The DO indicated that Big Island Air does not have a flight plan covering this half-island tour route. According to the DO, when pilots depart from a flight plan to circle the island and alter their course en route by proceeding directly back to KOA via the saddle area, they typically do not notify AFSS of the change. (Pilots could make this decision during flight because of meteorological conditions, volcanic activity, or tourist needs.) The DO reported that it was company policy for pilots to reverse course, as required, to avoid entering IMC. Two Big Island Air line pilots indicated their understanding and occasional use of this weather avoidance technique.

SFAR 71 provides operating rules for VFR air tour flights conducted in Hawaii under 14 CFR Part 135. The regulation states that, except during takeoff, landings, and other specific conditions, no person may conduct an air tour below an altitude of 1,500 feet agl.

In Big Island Air's FAA-approved Operations Specifications, the operator had received FAA authorization for a deviation from SFAR 71, permitting the operator to reduce the altitude

[12] When on the FAA-approved routes, the pilot could fly at the lowest altitudes permitted by the FAA.

[13] A caldera is a large crater formed by volcanic explosion or by collapse of a volcanic cone.

flown at specific locations and transition segments to no lower than 1,000 feet agl only when specific conditions were met. During flight, the airplane must be at least 500 feet below clouds, maintain 3 miles flight visibility, and remain within 1/2 nm on either side of the approved centerline of the approved flight route.

The FAA-approved transition routes were identified in the operator's SFAR 71 Deviation Procedure Manual, along with a map on which the respective routes were depicted. The accident site was approximately 3.5 miles laterally south of the depicted route segment referred to as segment "V-T," a portion of which parallels the 9,000-foot elevation topographical contour line. The POI reported that, to maintain the requisite 1,000-foot agl terrain clearance along this segment, the pilot would be required to climb to 10,000 feet msl. If the pilot were to fly more than 1/2 mile south of this segment, a higher altitude would be needed to comply with the terrain clearance requirements of SFAR 71.

ANALYSIS

The pilot was properly certificated and qualified in accordance with applicable Federal regulations and company requirements.

The airplane was properly certificated and equipped in accordance with Federal regulations and approved procedures. No maintenance discrepancies or corrective actions were noted between the airplane's last scheduled maintenance activity on August 31, 1999, and the date of the accident. The airplane had no recently reported maintenance history of navigation-related problems. Surveillance of Big Island Air by the principal operations inspector (POI) was consistent with the Federal Aviation Administration's (FAA) existing guidelines.

On August 30, 1999, 25 days before the accident flight, the pilot completed a recertification training program after his 11-month leave of absence from Big Island Air's employment as a tour pilot. During the FAA-administered flight check, the POI reviewed with the pilot the requirements of Special Federal Aviation Regulations 71, which provides operating rules for visual flight rules (VFR)-only air tour flights conducted in Hawaii under 14 *Code of Federal Regulations* Part 135. Remarks on the "Airman Competency/Proficiency Check FAR [Federal Aviation Regulations] 135" form indicate that the pilot completed the requirements satisfactorily.

Big Island Air's FAA-approved Operations Specifications and corresponding training program clearly indicate that all tour flights were to be conducted under VFR; no flying under instrument flight rules was authorized at any time. The accident pilot had over 11,500 hours of flight time, most of which was accumulated in the Hawaiian Islands. The pilot was therefore likely aware of and understood the VFR flight visibility and cloud clearance limitations. However, on September 4, 1999, 5 days after his recertification training, the accident pilot performed a tour flight, which was videotaped by a passenger. During the flight, the airplane can be seen flying in clouds on several occasions and in different locations. Further, witnesses indicated that on the day of the accident, the sky was overcast in the vicinity of the accident site. The Safety Board therefore concludes that on the accident flight, the pilot flew into instrument meteorological conditions (IMC).

The pilot was responsible for but did not obtain a preflight weather briefing from the FAA's Honolulu Automated Flight Service Station as required by the FAA. The FAA has no record of the pilot requesting a weather briefing for the accident flight or the flight he conducted earlier that day. The Safety Board concludes that the pilot's failure to obtain a preflight weather briefing was a deviation from standard operating procedures.

The accident airplane was equipped with very high frequency omni directional range, distance measuring equipment, and global positioning satellite receivers, which could have been used to indicate the accident airplane's position and ground clearance. Although the pilot was not required to use these navigational aids, when he departed visual meteorological conditions and flew into IMC, he should have used the navigational aids to accurately monitor his ground track and altitude. During the last few minutes of flight, when the airplane's ground clearance

was rapidly decreasing, the pilot did not reverse course or take emergency action. Radar data indicates that at this point in flight, the airplane's track varied little from its predominately west-northwesterly direction. If the pilot had been using his navigational aids correctly, he would have realized that he was nearing high terrain and would likely have changed his course.

The pilot's early awakening time and the length of his duty day raise the possibility of fatigue as a factor in this accident. However, in the absence of further evidence, the Safety Board cannot conclusively determine whether fatigue was a factor in this accident.

Because no blood sample from the pilot was available for analysis, the impact of the drug phentermine on pilot's behavior could not be analyzed or determined.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident is the pilot's decision to continue visual flight into instrument meteorological conditions (IMC) in an area of cloud-covered mountainous terrain. Contributing to the accident were the pilot's failure to properly navigate and his disregard for standard operating procedures, including flying into IMC while on a visual flight rules flight plan and failure to obtain a current preflight weather briefing.

Adopted on September 26, 2001