

ANC06FA018

HISTORY OF FLIGHT

On January 25, 2006, about 1250 Alaska Standard time, an Aero Vodochody L-39MS airplane, N104XX, a surplus military warbird built in the Czech Republic, was destroyed by impact and postimpact fire when it collided with the ground and an occupied trailer home during an instrument approach/circle to land at the Ketchikan International Airport, Ketchikan, Alaska. The experimental airplane was being operated as an instrument flight rules (IFR) cross-country ferry flight under Title 14, CFR Part 91, when the accident occurred. The airplane was operated by Air USA Inc., Quincy, Illinois. The airline transport certificated pilot, the sole occupant, received fatal injuries, and five persons on the ground received minor injuries. The flight departed in VFR conditions about 1141 from the Sitka Rocky Gutierrez Airport, Sitka, Alaska. While en route, the pilot obtained an IFR flight plan to Ketchikan. Instrument meteorological conditions prevailed in the area of the accident.

According to Federal Aviation Administration (FAA) personnel, the airplane was issued a special ferry permit by an inspector with the Van Nuys Flight Standards District Office (FSDO), Van Nuys, California, on January 23, 2006, with options to fly under visual flight rules (VFR) or instrument flight rules (IFR), day or night, from Anchorage, Alaska, to Seattle, Washington. A ferry permit was required because the accident airplane's most recent experimental airworthiness certificate had expired. The ferry permit application was signed by an FAA certificated mechanic who was hired by the operator, certifying that the airplane was safe for ferry flight. According to the operator, the accident airplane departed Palmer, Alaska, on January 23, about 1500, with another L-39MS airplane (N106XX), with an intended destination of Ketchikan. Due to adverse weather conditions in Ketchikan, the two airplanes diverted to Sitka, and remained there throughout the day of January 24. Because of a personal time commitment, the pilot of N106XX departed for his residence, leaving the airplane parked at Sitka.

On January 25, at 0710, the accident airplane pilot contacted the Sitka Flight Service Station (FSS) via telephone, stating he had tried to leave Sitka the previous day, and indicated he was trying to get to Bellingham, Washington. The FSS specialist provided weather conditions at Sitka and Bellingham, which were VFR at both locations. The pilot requested the winds aloft forecast for 24,000 and 27,000 feet, and after a discussion about where he would encounter the most adverse headwinds, the FSS specialist examined U.S. and Canadian weather charts and reported winds from 190 degrees at 84 knots at 24,000 feet, and from 190 degrees at 90 knots at 30,000 feet. The specialist also noted that there were AIRMETS for occasional moderate rime icing for the coastal waters of Alaska.

The FSS specialist stated that the current weather for Ketchikan was: "...wind, 140 [degrees] at 13 [knots], gusts 23 [knots]; visibility, 4 [statute miles] light rain and mist; ceiling, 1,200 [feet] broken, 1,700 [feet] overcast; temperature, 7 [degrees C], dew point 6 [degrees C]; altimeter, 29.23 [inHg]. What they've got there is basically the south end of a cold front from a low that's off to the east of us towards British Columbia and the Yukon, then, and so they're forecast to get a little bit of wind and snow today, diminishing basically towards the afternoon." The pilot commented: "O.K. so there, they'll be right above ah my mins to go in there..."

The pilot commented again about the forecast weather conditions at Ketchikan, stating: "...so just, man, I wish Ketchikan's weather was gonna be better, it's not any, not any better a thousand and three...just right at mins, hum." The FSS specialist stated: "and again, that wind that's outa the southeast at 13, gust up ta 23, that's a fair amount of wind for Ketchikan." The pilot replied: "yeah, that's a s### load of wind." The specialist jokingly inquired how the pilot liked Sitka, to which the pilot replied: "yeah, no kiddin, I just can't make Bellingham with those winds, I mean it's, I just can't do it." The briefing was concluded at 0721.

At 0855, the pilot again telephoned the Sitka FSS and inquired about the weather conditions in Ketchikan. The FSS specialist reported: "...wind, 340 [degrees] at 8 [knots]; visibility, 10 [statute miles] light rain and mist; ceiling 2,300 [feet] overcast; temperature 3 [degrees C], dew point temperature 1 [degree C]; altimeter, 29.29 [inHg]. ...I just got a pilot report from Ketchikan as well...from the top of the hour, a deHavilland Beaver, 6 miles west of Ketchikan reported 700 [feet] scattered; flight visibility 10 [miles], wind outa the west at 20 [knots], with higher cloud layers which were probably above 12,000 feet."

The distance from Sitka to Ketchikan is about 160 nautical miles. The operator reported that the normal range for planning purposes in the L-39 was about 750 nautical miles.

The pilot confirmed that the Ketchikan airport was utilizing runway 29 because of the wind direction and then stated: "and again, you said that METAR, that was 3,500 [feet] over [cast], that's what they were callin it." The FSS specialist initially agreed, stating: "3,200 overcast, yeah," but corrected himself, stating: "and that ceiling at 2,400 [feet] broken, this was, actually this is a new observation from 2 minutes ago, they just put another observation, ah, visibility, 10 [miles] light rain; 900 [feet] scattered, ceiling 2,400 [feet] broken, 3,200 [feet] overcast. ...ah I am showing AIRMETS for mountain obscuration and IFR conditions for southern, southeast Alaska, and I have an AIRMET for occasional moderate rime icing from 1,500 [feet] up ta 12,000 [feet]." The pilot thanked the specialist and concluded the call at 0859.

At 1140, the pilot contacted the Sitka FSS via radio and reported he was beginning to taxi, and at 1148, the pilot stated: "Sitka traffic, N104XX is departing VFR to the southeast, left turn out Sitka."

While en route to Ketchikan, the pilot contacted the Anchorage Air Route Traffic Control Center (ARTCC) at 1210. He reported that he was 90 miles northwest of Ketchikan at 17,500 feet, and requested the ILS approach to runway 11 at Ketchikan with a circle to land on runway 29. The controller verified the airplane was equipped with a GPS receiver (global positioning system), and cleared the airplane to the Ketchikan Airport, via DOOZI intersection, at 17,000 feet.

DOOZI intersection is 40 nautical miles from the Annette Island VOR, on the 303 degree radial.

At 1217, the ARTCC controller verified that the pilot had the current weather information from Ketchikan, and cleared the airplane at the pilot's discretion to descend and maintain 7,000 feet. At 1223, the ARTCC controller contacted the pilot and requested he slow down if he could, and told the pilot that he may have to hold at the DOOZI intersection for arrival aircraft ahead of him into Ketchikan. One minute later, the ARTCC controller amended the previous clearance, advising the pilot to maintain 8,000 feet and cleared him to hold at the 17 mile fix on the Ketchikan localizer, and to expect further clearance at 1240. The pilot responded by stating: "Roger that sir, is there any way you could hold us at DOOZI, my DME (distance measuring equipment) is intermittent for the leg." The controller then cleared the airplane to hold at DOOZI, and to maintain 8,000 feet.

At 1228, the pilot inquired whether the controller would prefer a left or right turn in holding, and the controller approved either direction. One minute later, the pilot contacted ARTCC and stated: "And ah center from 104XX, just be advised we are picking up some ah ice out here, and if you can give us a descent that would be great." The controller responded by stating: "N104XX ah roger, after you get back established in hold, make right hand turns and descend and maintain 7,000 [feet], that is as low as I can go for you there." The controller inquired if the pilot had the outside air temperature, to which the answer from the pilot was negative. At 1233:15, the ARTCC controller advised the pilot: "N104XX, the ah jet landed at Ketchikan, I've got one departing that's ah depart just as soon as the other aircraft leaves

the runway, and he should be clear in just about three or four minutes, and then you can expect an approach clearance after that." The controller asked if the pilot was still in the icing conditions, to which the pilot replied affirmative. At 1233:38, the controller told the pilot: "I show you back over DOOZI now, descend and maintain 7,000 [feet]." The pilot acknowledged the clearance.

At 1236:59, at 1237:21, and again at 1238:09, the ARTCC controller stated: "N104XX radar contact lost, say altitude." At 1238:14, the pilot responded, "7,000 [feet]." The controller then stated: "104XX maintain 7,000 [feet] until established on a published segment of the approach, cleared ILS DME-1, runway 11 approach to the Ketchikan Airport." The pilot acknowledged the clearance, and at 1239:22, the ARTCC control advised the pilot to contact Ketchikan Radio.

A review of radio traffic at Ketchikan revealed that at 1238, a de Havilland Beaver (DHC-2), N60G, provided a pilot report of the weather conditions in the Ketchikan area to the Ketchikan Flight Service Station, stating: "yeah, it's not very nice out here, um (unintelligible) scud, your probably 500 feet, maybe 2 miles at best, mixed rain and snow, ah, what's wind about ah oh 20, 25 [knots], I guess."

At 1239:42, the accident pilot contacted the Ketchikan FSS via radio and stated: "Ketchikan radio, 104XX is with you, ah we're at 7,000 [feet] for ah the intercept, ILS [instrument landing system], circle to land [runway] 29." The Ketchikan FSS specialist replied, "roger, report 10 [miles] out for, ah or the final approach fix 11 [mile] DME for ah traffic please, altimeter 29.32 [inHg]."

At 1244:01, the pilot stated: "and 104XX's 11 [DME]." The Ketchikan FSS specialist replied: "Albatross 4XX Ketchikan Radio roger, channel traffic, only one Beaver is inbound the harbor from the west, over the water. I have a Brasilia [airplane] holding at the top of ah Alpha [taxiway] for your arrival. No other traffic. Wind, 300 [degrees] at 16 [knots] gust 21 [knots], altimeter 29.32 [inHg], and I have to tell ya, it just, it does not look real favorable for a contact approach at this point, there is a ah 4 to 5 hundred foot layer east of the field for circling for [runway] 29, and ah I'll just, I will turn the lights up ta high for ya." The pilot replied: "O.K. thanks, we'll make the call when we get (unintelligible)."

At 1247:29, the pilot reported: "(unintelligible) contact with the ground, looking." At 1248:13, an unknown voice was heard on the Ketchikan FSS radio frequency, stating: "looks like he's abeam the Narrows, over the channel there Paul." At 1248:17, the pilot stated, "and I got the field in sight, I'm gonna try an cut the circle."

At 1248:49, the Ketchikan FSS specialist stated: "Albatross 4XX, I recommend an immediate climb and missed approach at this point, Ketchikan altimeter 29.34 [inHg]." In a supplement to his original personnel statement about the accident events, the Ketchikan FSS specialist indicated that he issued the recommendation for an immediate climb and missed approach because of the radio report of the accident airplane's position from a turbine de Havilland DHC-3 as, "over the water, by the narrows." According to the FSS specialist, that position report placed the accident airplane approximately 1 nautical mile northwest of the airport, which indicated to him that the airplane, "was off-course, and in potential danger."

At 1249:29 and again at 1249:59, the Ketchikan FSS specialist stated: "Albatross 4XX Ketchikan Radio, say your position." There was no response from the pilot.

A pilot-rated witness who was moving an airplane on a ramp at Peninsula Point, which is about 2.3 miles west the crash site, said he saw the airplane descend from the clouds, from about 200 feet above the waters of the Tongass Narrows, near Peninsula Point. The witness indicated that the visibility was about 3/4 mile in wet blowing snow, and the wind at the time was from the northwest, about 30 knots. The witness indicated he could see the outline of the Alaska Marine Highway vessel "Columbia" as it

was southeast bound toward the Ketchikan ferry terminal. The witness said the accident airplane, with the landing gear down, descended on about a 20 to 25 degree angle at a high rate of descent to the surface of the water, about 200 yards from the shore. The airplane struck the surface twice, each time gaining about 10 feet before skipping on the surface for a third time. The first two water impacts produced an extensive spray of water that obscured his view of the airplane. The airplane then gained altitude and climbed out of his sight.

The water impact location was about 1.2 miles from the threshold of runway 11, and about .4 mile left of the runway 11 centerline.

Several witnesses aboard the vessel "Columbia" were interviewed by an FAA inspector from the Juneau Flight Standards District Office. They reported seeing a large splash in the water between 3/4 to 1 mile in front of the vessel. They thought the splash was a whale, but due to the limited visibility of 1/2 to 3/4 mile, none reported seeing or hearing an airplane. When questioned about any visible evidence of an airplane impact, none reported seeing any debris or any type of oily sheen on the water.

Several witnesses reported seeing the airplane over Tongass Boulevard, (the main road of the City of Ketchikan, which runs along the coastline). One witness who was exiting a store near the crash site, reported hearing a jet engine sound that she described as sputtering and "one that did not sound right." She then heard a loud "bang" and looked up. Over the top of an adjacent building, she said she saw an airplane canopy, and in front of the canopy, observed a small parachute about 10 feet above the building that "was not full." She did not see the pilot seat, but she could see the crash scene at the trailer park. She said the visibility was low, and it was snowing hard.

A witness who was working at his residence directly above the crash site, reported that he heard jet engine sounds that abruptly stopped. After several seconds, he saw black smoke from the crash site. He said that it was snowing, the ceiling was about 150 to 200 feet, but he could see the outline of Gravina Island across the Tongass Narrows, which is about .4 mile.

Another witness driving on Tongass Boulevard, reported seeing the airplane descending from about 300 feet, out of the base of clouds, into snowing conditions. The wings were level, and the nose of the airplane was upward. He diverted his attention for a moment, and then saw the airplane nose down, about 45 degrees. He saw a small, white parachute, about 6 feet in diameter, that appeared to be opening and closing. The parachute appeared to be traveling the same speed, and along the "same line" as the airplane. He indicated that it appeared that the parachute may have been attached to some part of the airplane, but he could not be certain.

The unoccupied airplane collided with the ground in a large open lot on an easterly heading, struck the western bank of Carlanna Creek, and bounced/flew over the creek into a small trailer park area. The airplane struck a trailer home on the east side of the creek that was occupied by two persons. It then crashed into several unoccupied automobiles, and into an open lot area. Portions of airplane wreckage were located in Carlanna Creek, and within the interior of the trailer. The airplane fuselage, minus its wings and horizontal stabilizer, came to rest pointing upward, pinned against a hillside and an empty, metal dumpster/bin. Ketchikan Fire Department personnel responded to the scene and evacuated residents, and began fighting the trailer fire and the burning airplane fuselage.

INJURIES TO PERSONS

The pilot received fatal injuries. Five persons on the ground received minor injuries.

DAMAGE TO AIRCRAFT

The airplane was destroyed by impact and postimpact fire.

OTHER DAMAGE

Dwellings and several vehicles were damaged during the accident.

PERSONNEL INFORMATION

Pilot Information

The pilot was a former U.S. Marine Corps F-18 pilot. He held an airline transport pilot certificate with a multiengine land rating, a commercial pilot certificate with a single-engine land rating, a type certificate for CE-500, and an authorization for AV-L39 experimental aircraft. The most recent first-class medical certificate was issued to the pilot on May 31, 2005, and contained no limitations.

The operator reported that on an insurance policy application, dated January 10, 2005, the pilot listed his total aeronautical experience as 3,100 hours, of which 2,900 hours were in jet aircraft. His pilot-in-command time was 3,000 hours, of which 54 hours were accrued in L-39 aircraft.

A review of copies of the pilot's civilian logbooks revealed that his total civilian aeronautical experience consisted of about 849 hours, of which approximately 129 hours were accrued in all L-39 model aircraft, and about 20 hours in L-39MS aircraft. In addition, he logged about 43 hours in twin-engine Alpha Jet aircraft, which is a French-German military trainer. In the preceding 90 and 30 days prior to the accident, his logbook listed a total of about 90 and 12 hours, respectively.

The pilot's total aeronautical experience, and his total pilot-in-command experience listed on page 3 of this report, reflects his combined military and civilian hours. The other aeronautical experience totals are based on his civilian logbook entries.

The pilot was employed full-time as a U.S. Customs and Border Enforcement Air Interceptor Pilot, and had off-duty employment authorization. He arrived in Palmer, Alaska, on January 22, 2006, and was due to return to work on January 28th. The accident flight was the pilot's first flight to Ketchikan.

Company Information

The operator utilized several Aero Vodochody airplanes for training and air shows, and is a resource for sales and maintenance of the L-39. The operator also advertised their experience as a government contractor to provide tactical services to U.S. Defense Agencies, Defense Contractors, and Foreign Governments. The operator's web site noted that when used under government contract, the airplanes were utilized as a tactical service to enhance combat capabilities and readiness by providing electronic threat simulation and advanced combat presentations. The company noted their mission capabilities in air intercept training, air defense training, threat simulation, jamming, target towing, utility work, and advance combat maneuvering.

Review of FAA records on file for the accident airplane indicated that the operator's base of operations is Quincy, Illinois. They acquired the accident airplane in 2001, from the Czech Republic. On August 30, 2002, the airplane was registered to Hammer Jet Sales, Brookfield, Connecticut. Air USA, Inc. was authorized by Hammer Jet Sales on July 22, 2002, to act as an agent for processing and certifying the accident airplane.

On September 21, 2002, the airplane was issued an experimental exhibition airworthiness certificate by a designated airworthiness representative, maintenance, (DAR-F) through the FAA's Kansas City manufacturing inspection district office (MIDO), along with experimental Phase I and Phase II operating limitations, in accordance with Hammer Jet Sales Program Letter.

The accident airplane was issued an experimental airworthiness certificate for exhibition/research and development (R & D), along with operating limitations, to Hammer Jet Sales, by an FAA air safety inspector from the Van Nuys, California, FSDO, on January 15, 2003. The operating limitations noted that, "No person may operate this aircraft for other than the purposes of Research and Development or Exhibition as outlined in the Air USA, Inc. Program Letter dated January 8, 2003, and the airplane must be inspected in accordance with Air USA L-39 approved aircraft inspection program (AAIP), dated August 22, 2002."

On January 13, 2004, the Van Nuys FSDO issued an experimental airworthiness certificate for exhibition/research and development (R & D), along with operating limitations to Hammer Jet Sales, and the operating limitations noted that "No person may operate this aircraft for other than the purposes of Research and Development or Exhibition as outlined in the Air USA, Inc. Program Letter dated January 13, 2004, and the airplane must be inspected in accordance with Air USA L-39 AAIP, dated August 22, 2002."

On May 17, 2004, the airplane was again registered to Air USA, Inc. in Las Vegas, Nevada. The operator was issued an experimental airworthiness certificate for exhibition/research and development (R & D), along with operating limitations by the Van Nuys FSDO, on January 11, 2005. The operating limitations contained in the operator's program letter of January 11, 2005, noted that no person may operate the aircraft for other than the purposes of Research and Development or Exhibition as outlined in the Air USA, Inc. Program Letter, dated December 30, 2004. Airworthiness inspection of the airplane and ejection seats were authorized in accordance with the operator's L-39 AAIP, dated August 22, 2002.

The program letter of January 11, 2005, included limitations stating: "No person may operate this aircraft in commercial operations for carrying persons or property for compensation or hire. The owner/operator of this aircraft must notify the Van Nuys FSDO of any change in ownership or base of operation. Flights to maintenance facilities located at locations other than the aircraft's home base to have maintenance performed are allowed, however, the owner/operator must notify and receive permission from the geographically responsible FSDO prior to flight."

The program letter noted that upon changing between operating purposes (exhibition or research and development), the operator shall determine that the aircraft is in a condition appropriate for the purpose intended and shall document that finding in the aircraft records.

The operator had civil aircraft landing permits for USAF, Navy, and Marine Corps facilities.

The airplane's total airframe hours listed on the operator's application for an airworthiness certificate of December 30, 2004, was 748.9. The most recent experimental airworthiness certificate expired on January 11, 2006.

The accident airplane was one of four L-39MS airplanes that the operator disassembled and shipped in containers from Guam to Palmer, Alaska, for sale to, and reassembly by, Security Aviation, Anchorage, Alaska, in November, 2005. Security Aviation personnel reassembled the four airplanes, but the sale contract terms became a dispute between the operator and Security Aviation. The operator took repossession action on January 21, 2006. On January 23, the operator requested a ferry permit to move two airplanes out of Alaska.

An FAA inspector, Van Nuys FSDO, issued a special flight permit for the accident airplane on January 23, 2006, for a maintenance flight from Anchorage, to Seattle, Washington, which was valid until arrival at the destination, or until January 31, 2006.

AIRCRAFT INFORMATION

The accident airplane, produced by Aero Vodochody for the Czech Republic military, was one of six L-39MS airplanes manufactured as the development platform for the L-59 Super Albatros. Literature about the L-39MS lists it as the Czechoslovak Air Force designation for the L-59. The operator of the airplane reported that the MS version is essentially an L-59, and the accident pilot was utilizing an L-59 flight manual for the accident airplane. The MS version of the L-39 has a Povazske Stroguarne DV-2 engine equipped with an engine computer, which produces 4,850 pounds of thrust, an auxiliary power unit, hydraulic-actuated elevator and aileron controls, an upward-tilting hydraulic canopy, a heads-up navigation display (HUD), and zero-zero VS-2 ejection seats.

The airplane's maintenance program was conducted under an Approved Aircraft Inspection Program (AAIP). Review of the airplane's maintenance records revealed that the most recent inspection, a 50 hour or 6 month inspection, was conducted on the airframe and engine on January 20, 2005. At that time, the airplane had accrued 748.9 hours, and the engine had accrued 701.4 hours. The operator indicated that the engine's life limit was 800 hours. The airplane received a pitot-static, transponder, altimeter, and encoder inspection, certified to 35,000 feet, on February 24, 2004. The engine had an oil analysis conducted on February 5, 2004, by Shell Care, Hoffman Estates, Illinois, which was normal.

According to weight and balance information dated September 20, 2002, the basic empty weight of the airplane was 9,810 pounds, which included zero unusable fuel. According to the L-59 flight manual, basic ramp weight was 12,125 pounds, with a maximum permitted takeoff weight of 15,430 pounds.

The airplane's fuel system consisted of 4 interconnected fuel tanks in the fuselage, 2 wing tip tanks, and 2 drop tanks, one mounted below each wing. The main fuel tanks had the capacity of 292 gallons. The wingtip tanks held a total of 120 gallons, the drop tanks held a total of 185 gallons, for a total capacity of 597 gallons. The fuel supply to the engine was drawn from the main fuel tanks. As fuel was consumed from the main tank, a transfer pump would pump fuel into the main tanks from the drop tanks, then the wingtip tanks, until they were empty.

Fueling records from Aero Services, Sitka, established that the aircraft was last fueled on January 25, with the addition of 402 gallons of Jet A aviation fuel, and 25 gallons of deicing fluid, which filled all tanks.

The normal (green band) engine exhaust gas temperature range is 400 to 715 degrees C.

The operator reported that the airplane's HUD was deactivated, because it was primarily used for weapons control. The airplane had electronic flight information system data displayed on two multifunction displays, one above the other, located in the center of the instrument panel. The operator reported that the upper display was usually utilized as a primary flight display, and the lower display for maps during en route flight, and an electronic horizontal situation indicator (HSI) during the approach phase of flight. The airplane had conventional instrumentation for attitude, altimeter, vertical speed, turn and bank, and an HSI located on the left side of the instrument panel. It also had a hand-held global positioning system (GPS) receiver mounted on the instrument panel glare shield.

Prior to departure from Palmer, Alaska, the operator reported that the accident airplane was not test-

flown. A leak check of the pitot-static system was performed, as well as an engine run-up, and operational checks of the landing gear and speed brakes utilizing a hydraulic mule. The engine is equipped with a hydro/mechanical fuel control, with an engine computer. The operator indicated that for the ferry flight, the engine computer was inoperative, which placed the fuel control in manual mode. The operator reported that when in manual mode, the engine would have about a 3 to 4 percent power penalty, which would only be apparent during high temperature environments, and would not be noticeable to the pilot during power manipulation. All avionics, except the HUD, were reported to be operational.

The flaps have three positions; retracted, 25 degrees (usually for takeoff and initial approach) and 55 degrees (full flaps). The operator reported that the airplane has an airspeed limitation affecting the operation of the flaps. At an airspeed of about 167 knots, plus or minus 8 knots, the flaps will automatically retract.

The airplane canopy is hydraulically operated and hinged at its aft end. It has a metal frame with a middle support bow between the front and rear cockpit positions. It is equipped with an emergency canopy release lever in each pilot seat location. The lever is retained in a locked position by safety wire. It has two rocket motors, one on each side of the lower forward edge of the canopy, which are fired during the ejection seat sequence. The canopy can be jettisoned during flight without initiating an ejection sequence.

The airplane's ejection seats consist of three components, the ejection gun, the seat structure, and the seat pan with rocket motor. The seat escape system includes a two stage ejection system. The ejection gun provides the initial power and the rocket motor for acceleration. The parachute set is located in the backrest and headrest, and a survival kit is in the backrest. The seat is equipped with an emergency oxygen supply and an automatic leg restraint system to draw back and restrain the occupants legs during ejection. The ejection sequence is fully automatic with the seat being ejected after the canopy is jettisoned. In the event that the canopy cannot be jettisoned, ejection can be done through the canopy.

A review of emergency ejection information contained in the L-59 flight manual disclosed that the VS-2 ejection seat can be utilized to rescue the crew from zero airspeed and zero altitude, up to the permitted maximum speeds and altitudes within the airplane's airspeed envelope, provided that the airplane is in straight and level flight. The time delay from the moment of pulling the firing handle until the seat starts moving, is 0.6 seconds. A cable attached between the seat and the airframe activates the main seat rocket motor as the seat departs upward. A small pyro charge pushes out a small parachute drogue, which, as it hits the air stream, pulls the seat-stabilizing parachute and pilot parachute from the storage area at the top of the ejection seat headrest. During a normal ejection sequence, as the pilot descends under parachute, the seat will fall away. A seat release lever allows the pilot to separate from the seat if the automatic release fails.

Minimum rescue altitudes vs. airspeeds when in dive flight, without any bank, are contained in various charts in the L-59 manual. A copy of the minimum rescue altitude chart for solo flight, when in a dive, is included in the public docket of this report.

The airplane's VS-2 ejection seat cartridge log indicated that the seat ejection gun rockets (used to initially start the seat accelerating upward from the cockpit) were installed in January, 2004, and expired in January, 2006. The canopy jettison rockets (used to fully release the entire canopy from the airframe), were installed in January, 2004, and were due to expire in January, 2007. The pyro cartridges for the seat rocket motor were installed in January 2004, and expired in January 2006. The pyro cartridges for the parachute were installed in January 2004, and were due to expire in January 2009. The pilot and copilot parachutes have a packing life of 24 months. They were repacked in January 2004, and expired in

January, 2006.

The FAA's Airworthiness Inspector's Handbook, 8300.10, contains a definition of maintenance intervals, and states, in part: "Note: A calendar month is the period of time from the first day of a month to the last day of the month. In a calendar month, compliance can be achieved at any time during the month, up to and including the last day of the month..."

METEOROLOGICAL INFORMATION

An area forecast for the coastal waters of southeast Alaska issued at 0545, and valid until 1800, stated, in part: Clouds and weather; AIRMET for IFR and mountain obscuration, from Port Alexander [54 miles southeast of Sitka] south, occasional ceilings below 1,000 feet with visibility below 3 statute miles in light snow and light rain showers, weakening. Otherwise, Port Alexander south, 1,500 feet scattered, 3,000 feet broken to overcast; visibility, 3 to 5 statute miles in light snow and rain showers. Elsewhere, 1,200 feet scattered to broken. Outlook, valid from 1800 to 1200 on January 26, VFR. After 0300 on January 26, marginal VFR due to ceilings in rain. Turbulence, none significant. Icing and freezing level, AIRMET for icing from Port Alexander south, occasional moderate rime icing in clouds from 5,000 to 16,000 feet. Freezing level from surface; north 1,500 feet to the south, weakening.

An area forecast for the coastal waters of southeast Alaska, issued at 1145, valid until 2400, stated, in part: Clouds and weather; AIRMET for mountain obscuration, from Port Alexander south, mountains occasionally obscured in clouds with light snow, improving. Otherwise, south of Port Alexander, few clouds at 900 feet, 1,200 feet broken, 2,000 feet overcast, tops at 10,000 feet; visibility, 3 statute miles in light snow; isolated ceilings below 1,000 feet with visibility below 3 statute miles in light snow. Port Alexander north, spreading to sections by 1500, 6,000 feet scattered. From 2300, from Hydaburg south, spreading north, 1,500 feet broken, 4,500 feet overcast, tops at 22,000 feet; visibility 4 statute miles in light rain and light rain showers; surface wind from the southeast with gusts to 20 knots, increasing. Outlook, valid from 0000 to 1800 on January 26, VFR except Hydaburg south, spreading north, marginal VFR due to ceilings in rain and wind. Turbulence, none significant. From 2300, Hydaburg south, spreading north, occasional moderate turbulence below 6,000 feet. Icing and freezing level, south of Hydaburg until 1500, isolated moderate rime icing in clouds from 2,000 to 10,000 feet. Otherwise, none significant. Freezing level, north, near the surface.

A terminal forecast for Ketchikan issued at 0841 on January 25, valid from 0900 to 0900 on January 26, was reporting, in part: Wind, 160 degrees (true) at 7 knots, gusts to 17 knots; visibility, greater than 6 statute miles in rain; clouds and sky condition, 1,300 feet broken, 1,700 feet overcast. From 1300, wind, 320 degrees at 9 knots; visibility, 3 statute miles in light snow showers and mist; clouds and sky condition, 1,500 feet broken.

At 1153, an aviation routine weather report (METAR) at Ketchikan was reporting, in part: Wind, 330 degrees (true) at 10 knots; visibility, 3 statute miles in light snow and mist; clouds and sky condition, 500 feet scattered, 2,000 feet broken, 2,700 feet overcast; temperature, 36 degrees F; dew point, 34 degrees F; altimeter, 29.30 inHg; remarks, unknown precipitation ended at 1055, rain began at 1055, harbor wind, 270 degrees (true) at 20 knots, gusts to 25 knots.

At 1253, a METAR at Ketchikan was reporting, in part: Wind, 330 degrees (true) at 14 knots; visibility, 4 statute miles in light snow and mist; clouds and sky condition, 400 feet scattered, 1,200 feet broken, 2,300 feet overcast; temperature, 36 degrees F; dew point, 34 degrees F; altimeter, 29.33 inHg; remarks, rain ended at 1223, snow began at 1223, harbor wind, 310 degrees (true) at 11 knots, gusts to 18 knots.

A special weather observation at 1304 was reporting, in part: Wind, 330 degrees (true) at 14 knots;

visibility, 2 statute miles in light snow and mist; clouds and sky condition, 400 feet scattered, 1,000 feet broken, 1,800 feet overcast; temperature, 34 degrees F; dew point, 34 degrees F; altimeter, 29.33 inHg.

Routine pilot reports received in the Ketchikan area included one received at 0744 from the pilot of a turbine deHavilland DHC-3, 7 miles west of Ketchikan, reporting the sky cover as ceilings of 500 to 600 feet; visibility, 2 to 3 statute miles; remarks: "Winds really howling in Clarence Strait, waters off Vallenar Point (the north end of Gravina Island) really black."

At 0806, the pilot of a deHavilland DHC-2, 6 miles west of Ketchikan, reported the sky cover as 700 feet scattered; visibility, 10 statute miles; wind, from the west at 20 knots; remarks, higher cloud layers.

At 1230, the Anchorage ARTCC reported from the pilot of the accident airplane that at 9,000 feet, 40 miles from the Annette VOR on the 310 magnetic radial, there was light rime icing.

At 1240, the pilot of a deHavilland DHC-2, 7 miles west of Ketchikan, reported the sky cover as variable at 500 feet; visibility, 2 statute miles in rain and snow; remarks: "Conditions not very good."

COMMUNICATIONS

A transcript of the air to ground communications between the airplane and the Anchorage ARTCC, and the Sitka and Ketchikan FSS facilities, is included in the public docket of this report.

AIRPORT AND GROUND FACILITIES

The Ketchikan International Airport is located on Gravina Island, separated from the city of Ketchikan by the Tongass Narrows. Its elevation is 88 feet mean sea level (msl), and it has a single, hard-surfaced runway on a 111 to 291 degree magnetic orientation.

Runway 11 is 7,500 feet long by 150 feet wide, and is equipped with high intensity runway lights, a medium intensity approach lighting system, with sequenced flashing lights, and a precision approach path indicator. The runway and approach lights were on maximum intensity. Runway 29 is equipped with a medium intensity approach lighting system and runway alignment indicator lights, and a visual approach slope indicator.

The initial approach fix for the ILS DME-1 approach to runway 11, is located at 11 DME, or 9.7 miles from the runway touchdown point. The ILS DME-1 approach to runway 11 has a decision altitude of 1,000 feet msl, with the missed approach point at 4 DME, or 2.7 miles from the runway touchdown zone. The minimum visibility requirement for the ILS is 3 statute miles.

The ILS DME-1 procedure contains the following notes: "Any go-around commenced after passing the MAP (missed approach point) will not provide standard obstruction clearance. No turns permitted after passing D8.0 (8 DME) [from] IECH (Localizer/DME transmitter station) inbound. If approach aborted, execute published missed approach. Fly visual to apt (airport), 109 degrees - 2.7 NM (nautical miles)."

The circle to land procedure has a minimum descent altitude (MDA) of 2,500 feet at 120 knots, with a visibility requirement of 3 miles. At 140 knots, the minimum descent altitude is 2,700 feet, with a visibility requirement of 3 miles. The ILS DME-1 procedure contains the following notes: "1. CAUTION: Rising terrain both sides of final approach. Strong winds may cause severe turbulence. Do not permit full scale CDI deflection. 2. ADF required for missed approach. 3. During VFR conditions watch for opposing traffic on localizer."

WRECKAGE AND IMPACT INFORMATION

The National Transportation Safety Board investigator-in-charge (IIC) and parties to the investigation from the operator, the FAA, and the Federal Bureau of Investigation (FBI), examined the airplane wreckage at the accident site on January 26 to January 28, 2006. The airplane's flight path, before ground impact, was established by noting the first item found from the airplane, which was the pilot's helmet bag, followed by the canopy, and then the airplane's ground impact scars, and wreckage point of rest. This debris field was on a magnetic heading of 090 degrees. (All heading/bearings noted in this report are oriented using magnetic north.)

Airframe

The canopy, separated from the airframe, was located inverted next to a metal building, about 95 feet east of the pilot's helmet bag. The canopy glass was fragmented and scattered at the point of rest. The two canopy ejection rockets, normally positioned along the lower edge and each side of the canopy frame, forward of the middle support bow, were broken from the frame at the bottom edge, but were lying adjacent to the canopy. Each rocket nozzle had black sooting on their respective exhaust ports. The aft pivot points and the hydraulic actuator attach point were undamaged.

Fragmented portions of aviation maps and paperwork were found in the vicinity of the canopy, and between the canopy and the airplane's initial ground impact point.

The first observed evidence of ground impact was in an open lot, west of Carlanna Creek, where three, near-parallel scuff marks consistent with being made by the landing gear, disrupted the ground. A fragment of metal was embedded in the soil at the beginning of the left scuff, and there was a slight surface gouge along the right edge of the left scuff. The scuff marks were oriented along the airplane's path, and each had a slight fan-shaped appearance. The left scuff mark began before the others, and was about 387 feet from the canopy. The distance from the left scuff mark to the center mark was about 6 feet, which in turn was about 4.5 feet from the right soil disruption. The center and right scuff marks began about 407 feet from the canopy. There was a strong odor of aviation jet fuel in the area of ground impact.

Fragments of metal were found past the initial point of ground contact, and the left speed brake was located at the left side of the ground impact area, about 470 feet from the canopy, between the initial impact point and the west bank of Carlanna Creek. The speed brake door was fractured at its inboard attach point and had longitudinal scratching along its outer surface.

Small bushes and birch trees were sheared near ground level along the west bank of Carlanna Creek, which is about 515 feet from the canopy. Parts of the airplane were recovered from the bottom of the creek, which included portions of the wing drop tanks, the fuselage, and one main landing gear assembly.

The width of Carlanna Creek, where the airplane bounced/flew across, was estimated to be about 60 feet. The next observed impact areas were trees and a trailer home along the east bank of Carlanna Creek. The wreckage path continued past the trailer into an open lot, to impact and damage parked vehicles, parked boats, and personal possessions.

A portion of wing was located to the right of the trailer impact point. It had crushing and tearing of the inboard and outboard ends. Portions of wing structure, and a separated landing gear assembly, were found within the wreckage of the trailer home. The horizontal stabilizer was torn off the fuselage and located along the wreckage path, about 79 feet from the east edge of Carlanna Creek. Another portion of

wing was found to the right of the stabilizer. The elevator remained attached to the stabilizer. Portions of aileron were found between the trailer debris and the stabilizer. The fuselage came to rest about 105 feet from the east edge of the creek, and about 680 feet from the canopy. A wreckage diagram is included in the public docket of this accident.

The vertical stabilizer remained attached to the fuselage. It had aft crushing of the leading edge, about 3 feet below the top. The rudder was attached and appeared undamaged. Examination of the aft (white) position indicator bulb revealed that the bulb was intact, and the filament was stretched.

Both main landing gear assemblies were torn from their respective wing attach points. Both had extensive damage to the forward edges of the gear struts, damage to the drag links, and compression damage and fracturing of the gear strut cylinders. The right main wheel had aft crushing with tearing and rupture of the right main gear tire, adjacent to the wheel damage.

The nose gear assembly, at the wreckage point of rest, was torn from its attach points, but was attached to the wreckage by linkage, and was resting on top of the forward end of the airplane.

Both wings were torn off the airplane near their inboard attach points at the fuselage. Examination of the inboard segment of the separated left wing revealed aft and vertical crushing of the leading edge. The left wingtip tank was attached to the outboard end of the wing. It was torn open at the forward end, with aft crushing, and the trailing end was torn away from the wing. The left wingtip tank contained residual fuel in the tank. The operator indicated that the presence of fuel in the wingtip tank indicated that the main fuselage fuel tanks would be at least 7/8 full. The right wing was fractured, burned, and torn from the fuselage, and was segmented into two sections, each about 6 feet long. The right wingtip tank was extensively crushed and torn from the wing. The ailerons and flaps were torn off both wings. Both wing drop tanks were extensively crushed and torn, and each were torn from their respective wing attach points.

The flap tracks were fractured at the aft end of each wing. One segment of flap track had a portion of flap attached, along with its corresponding flap rollers, which were retained in the flap track at their most inboard position of travel.

The horizontal stabilizer, including the fuselage tail pipe enclosure, was torn off. It had semicircular aft crushing of the leading edge, about 3 feet outboard from the right side of the fuselage, and the outboard tip was torn off. The outboard end of the right elevator was bent up and inward about 130 degrees at the center hinge bracket, and had aft crushing at the tip. The hydraulic actuator for the elevator was attached to the elevator, but torn from its corresponding fuselage attach point. The outboard end of the left horizontal stabilizer was crushed aft about 3 feet outboard from the fuselage, with aft and upward bending and separation of the outboard end. The left elevator had inboard and aft crushing at the center hinge bracket.

The bottom of the fuselage was crushed upward, and the nose had aft and upward crushing from about the rear cockpit forward. The right side of the forward cockpit area was bent and crushed to the left. There was extensive destruction of the fuselage, forward of the front cockpit instrument panel. There was extensive fire damage and destruction of the fuselage from the rear cockpit to the tail, primarily along the right and upper side of the fuselage. The left side of the fuselage had some burn-through near the fuel bladder area, but was less damaged than the right side.

Both ejection gun telescoping tubes were extended above the fuselage from each cockpit. The hydraulic actuator for the canopy was extended.

The postcrash fire incinerated most of the forward, and some of the rear cockpit areas, however, some instrument readings were obtained. The throttle position in both cockpits was full forward. The speed brake switch was in the "in" position. The forward cockpit exhaust gas temperature (EGT) gauge was missing its outer glass and was sooted. Both its needle and tumbler style indicator registered about 625 degrees C. The operator reported that the EGT will retain its last indication if electrical power is lost before normal engine shut down. The rear seat fuel totalizer indicated about 590 kilograms of fuel. (Note: The rear seat fuel totalizer is not visible to, and cannot be reset by, the front seat occupant.) The rear seat airspeed indicator needle was about 122 knots. The rear seat mach meter was about .80.

The engine inlet plenums appeared intact. The fuel bladders were destroyed. The hydraulic system levers were in their normal position. The landing gear handle was in the down position. The emergency canopy release latches were still safety wired in a locked position.

Pilot's Ejection Seat

An examination of the pilot's ejection seat revealed the drogue parachute deployed, as did the seat stabilizing parachute. The pilot's parachute was in its proper position in the seat headrest, retained in its packing with the release pin still held in-place by retaining thread. The headrest portion of the seat was deformed and bent to the left. The strap connecting the seat stabilizing parachute and the pilot's parachute, was found to have pulled through and tore the aft, left corner of the headrest/parachute compartment. The strap had been previously cut by rescue personnel about 10 inches above the headrest compartment. The seat pan was torn and bent to the left from the seat back.

All of the seat's pyro charges, and the main rocket motor, discharged. The seat's pyro connector ring, located on the lower right seat back, to which all the seat pyro arming cables are clipped, separated from the seat as designed during the ejection sequence. The connector ring was retained in the forward cockpit, with all the pyro arming cables attached, along with the seat dynamic pressure sensor hose, and the seat separation timer activation cord. The seat ejection handle was extended, consistent with activation by pulling the handle. No preimpact malfunction of the seat ejection mechanism was discovered during the investigation.

Engine

On March 28, and 29, an engine examination was conducted at a hangar located at Temsco Helicopters, Ketchikan. A party representative from the operator, the NTSB IIC, and an NTSB powerplant engineer, participated in the examination.

The inspection revealed that outer bypass duct between the aft end of the fan case to the rear bearing housing was burned and melted on the right side of the engine. There was no evidence of an in-flight fire. The right corner of the accessory gearbox was fractured and burned, but otherwise intact.

The first-stage fan blisk's outer leading and trailing edge corners of all the blades were battered and fractured. Liberated pieces of the blades were not recovered. All displaced material on the fractures was deformed in the direction opposite of rotation. About 1/3 of the fan blade material of each blade was missing.

There was rotational scoring on the interior of the fan shroud, adjacent to the fan, with heavy scoring at the 3 and 9 o'clock positions. There were multiple intermittent scraping deposits consistent with the fan material, from the inlet shroud flange to just ahead of the fan plane of rotation. Removal of melted globs and debris between the fan and duct permitted hand rotation of the fan, with accompanying rotation of the power turbine wheel.

The interior radius of the fan shroud was measured at 12 locations at 30 degree intervals. The smallest dimensions were noted at the 180, 210, and 240 degree locations, next followed by the 0 and 30 degree locations. The largest dimensions were noted at the 300 and 330 degree locations, next followed by the 120 and 150 degree locations.

Two first-stage stator vanes, one at the 2 o'clock and the other at the 9 o'clock position, were fractured near their respective bases. About 1/2 of the first-stage supercharger rotor blades were fractured at mid-span or less, in a random pattern.

The compressor variable guide vane, levers, and synchronizing ring could be moved with difficulty by hand. The variable guide vane actuator piston could be moved by hand once it was detached from the synchronizing lever, and its indicator was at 20 degrees, which corresponds to a normal engine power setting. The high pressure compressor case was intact except for an area of burn-through on the upper right quadrant. A hole was cut into the compressor case for visual examination, and the rotor could be rotated by hand. All the compressor 2 to 7 stage rotor blades and stator vanes had sharp-edge tears to the leading and trailing edges.

A hole was cut into the combustor plenum and liner for examination. No metal spatter was found in the combustor and the liner was undamaged. Examination of fuel manifolds and nozzles were unremarkable.

The high pressure turbine nozzle and turbine appeared undamaged. No metal spray was found. The low pressure turbine appeared undamaged, and no metal spray was observed. The rear of the turbine bearing housing and aft cone were undamaged.

The fuel control was covered in soot, but otherwise undamaged. The fuel control lever was observed at the 82 degree position, which corresponds to a flight idle power setting. Upon removal from the engine, fuel was present in the fuel lines at the fittings. The input spline was intact and oil wetted, and could be rotated by hand. The fuel filter was free of contaminants.

The engine oil pump housing was fractured, but contained residual oil. The oil filter was removed and its elements separated. They were blackened and contained minor debris, but otherwise unremarkable. The oil chip detector had signs of overheating, but had no significant debris.

The engine tailpipe, where it attached to the aft end of the engine, had bending and folding of the metal tube about 6 inches aft of the engine case, producing sharp creases and folds that were not cracked or broken. The tailpipe had an oval shape near the aft end of the tube, and the inside of the tailpipe had multiple intermittent scraping deposits of a soft metal consistent with fan blade material.

The Powerplant Group Chairman's factual report is included in the public docket of this report.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination of the pilot was conducted under the authority of the Alaska State Medical Examiner, 4500 South Boniface Parkway, Anchorage, Alaska, on January 30, 2006. The examination revealed that the cause of death for the pilot was attributed to blunt force injuries.

A toxicological examination was conducted by the FAA's Civil Aeromedical Institute (CAMI) on February 22, 2006, and was negative for any alcohol or drugs.

FIRE

A postcrash fire involving trailers and the airplane required numerous fire-fighting personnel from the Ketchikan Fire Department. While fighting the airplane fire, the rear ejection seat's ejection gun rocket activated, blowing the rear seat out of the fuselage and landing about 100 feet from the fuselage point of rest. The rear seat's main rocket motor did not fire. This presented a significant hazard to all personnel, which hampered cleanup and return of trailer park residents until the seat was rendered safe by military explosive personnel on January 28, 2006.

SURVIVAL ASPECTS

Examination of the pilot's ejection seat pyro cartridges revealed that all had expended. The seat's initial drogue and the seat-stabilizing parachute was found extended from its headrest location, but the pilot's parachute was not pulled from its pack. The pilot's seat collided with several trees at low level.

SEARCH AND RESCUE

Following the crash, aerial and ground search teams could not initially locate the pilot. He was found on the east bank of Carlanna Creek, on about a 7 degree angle to the right of the airplane's wreckage path, and about 650 feet from his helmet bag.

TESTS AND RESEARCH

Two hand-held Garmin 295 GPS receivers were found in the airplane wreckage. Both units were examined by Garmin International personnel, Olathe, Kansas, who reported that both received impact damage. No position data could be recovered from the units.

An annunciator panel, recovered from the rear seat cockpit, was examined by the NTSB's Materials Laboratory. The examination revealed that none of the annunciator indicator light bulb filaments had any evidence of hot stretching relaxation of the filament coils.

ADDITIONAL INFORMATION

Special Airworthiness Certificates

According to Title 14, CFR Part 21, special airworthiness certificates are classified by the FAA as primary, restricted, limited, light-sport, provisional, special flight permits, and experimental. FAA Order 8130.2F, Chapter 4, Section 13, Paragraph 191, General, notes that a special flight permit is effective for the period of time specified in the permit, and are issued for aircraft that currently may not meet applicable airworthiness requirements, but are capable of safe flight.

The FAA order notes that special flight permits for the purposes other than production flight testing and customer demonstration flights will be issued by the FSDO/MIDO/IFO geographically responsible for the area in which the flight is to originate. If the applicant's aircraft is outside the jurisdiction of the FSDO/MIDO/IFO receiving the request, the applicant should be referred to the appropriate office.

Paragraph 194 of the Order, Aircraft Inspections, states that it is the responsibility of the FAA to determine which inspections or tests are necessary to ensure the aircraft is capable of safe flight for the intended purpose. The FAA must make, or require the applicant to make, appropriate inspections or tests considered necessary for safe flight. The FAA must personally inspect damaged aircraft, or an aircraft for which the airworthiness is questionable in any respect. The FAA must personally inspect those

aircraft models for which a U.S. type certificate has never been issued.

The Order notes: If an affirmative, technical determination cannot be made that a particular aircraft is capable of safe operation because of insufficient design, inspection, or maintenance data that normally is available for a type-certificated aircraft, the special flight permit should not be issued.

When the FAA requires the applicant for a special flight permit to make the inspection, the applicant must be advised that such inspections must be accomplished by an appropriately certificated mechanic or repair station familiar with all the procedures and requirements contained in the Order, and must be documented in the aircraft logbook by the authorized person who conducted the inspection.

The accident airplane did have a special flight permit, but it was issued by the Van Nuys FSDO. During the accident investigation, personnel from the Anchorage FSDO related that they were notified of the movement of the two airplanes from Palmer, Alaska, to Sitka, Alaska, when the pilot's used a "Viper" call sign, rather than the "N" number of each airplane. Further investigation of the flight initiated an Anchorage FSDO inquiry about possible non-compliance with FAA orders by the use of a faxed copy of a ferry permit from another FSDO. Documentation of the Anchorage FSDO's concerns is contained in the public docket of this report.

Exhibition and Research and Development Aircraft

Aircraft that are issued experimental, exhibition and/or research and development airworthiness certificates, are covered by guidance contained in FAA Order 8130.2F. An airworthiness certificate issued for research and development is valid for 1 year, and according to Title 14 CFR Part 21.191, are issued for testing new aircraft design concepts, new aircraft equipment, new aircraft installations, new aircraft operating techniques, or new uses for aircraft.

According to FAA Order 8130.2F, Chapter 4, Section 11, Paragraph 163, General, states that any aircraft would be eligible for an experimental airworthiness certificate for research and development under the provisions of Title 14 CFR Part 21.191. Although the operations may eventually lead to a type certificate, they may be conducted by the applicant only as a matter of research or to determine whether an idea warrants further development.

The order further states that former military aircraft are often used in research and development projects, and it is appropriate to use guidance in the order when performing research and development certification of former military aircraft. An experimental airworthiness certificate for research and development would also be valid to show compliance for the issuance of a type certificate, a supplemental type certificate, major design changes, and function and reliability requirements. The purpose is to show compliance to the CFR (Part 21.191) after the applicant has completed testing under research and development, if applicable, and completed flight testing by the FAA.

According to FAA Order 8130.F, airworthiness certificates issued for exhibition have an unlimited duration, and are issued to exhibit an airplane's flight capabilities, performance, or unusual characteristics at air shows, motion picture, television, and similar productions, and the maintenance of exhibition flight proficiency, including (for persons exhibiting aircraft) flying to and from such air shows and productions.

According to FAA Order 8130.2F, Chapter 4, Section 10, Certification and Operation of Aircraft Under the Experimental Purposes of Exhibition and Air Racing, Paragraph 156, Former Military Aircraft, states that surplus military aircraft have historically operated in the United States for research and development, air racing, and exhibition purposes in the experimental category. It is the policy of the

FAA that eligible aircraft will be certificated in the experimental category when operated for the special purposes of exhibition or air racing. Examples of these turbine power aircraft, listed as Group II aircraft by the FAA, include MiG-17, L-39, T-33, OV-1, etc.

Paragraph 157, Brokering, states that CFR Part 21.191(d) was not intended to allow for the brokering or marketing of experimental aircraft. This includes individuals who manufacture, import, or assemble aircraft, and then apply for and receive experimental exhibition airworthiness certificates so they can sell the aircraft to buyers. Certificating offices must insure that all applicants for exhibition airworthiness certificates are for the purposes specified in Part 21.191(d), and are from the registered owners who will exhibit the aircraft for those purposes.

The FAA has developed a recommended inspection program for L-39 aircraft with an exhibition airworthiness certificate, under Advisory Circular AC-43-209, dated October 16, 2003. The advisory circular can function as the basis for the issuance of an approved airworthiness inspection program, and addresses L-39C aircraft with an Ivchenko AI-25TL engine.

Wreckage Release

The Safety Board released the airframe, located at the U.S. Army Reserve Armory, Ketchikan, to the owner's representatives on February 9, 2006. The engine and rear seat annunciator panel were retained by the Safety Board for examination. The engine, located at a Temsco Helicopters hangar, Ketchikan, was released to the owner's representative on March 30, 2006. The annunciator panel was released on July 24, 2006.

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