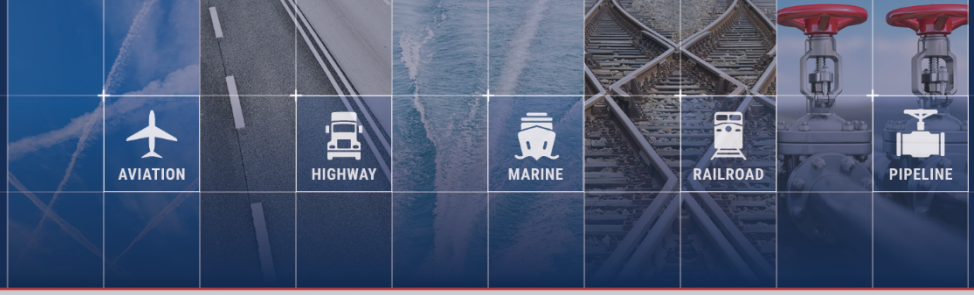

Aviation Investigation Final Report

Location:	PURDY, Washington	**Accident Number:**	SEA96FA175
Date & Time:	August 2, 1996, 01:19 Local	**Registration:**	N9360M
Aircraft:	Mooney M20E	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The noninstrument-rated pilot wanted to return home to manage a bowling tournament. Since marginal visual flight rules (VFR) conditions were forecast for the following day, the pilot decided to leave that evening. After takeoff, flight service informed the pilot that weather conditions were deteriorating on the flight's planned route, but the pilot replied he would continue toward his destination. The aircraft subsequently passed east of Bremerton (which was reporting a 600-foot overcast ceiling) at 2,900 to 3,000 feet. Two minutes later, the aircraft entered a descending left turn to the east. In this turn, the aircraft's speed increased above never-exceed speed and its descent rate increased to 2,400 feet per minute before it disappeared from radar. Four seconds later, the pilot called air traffic control (ATC) for help, but no further transmissions were received. The aircraft crashed 1/2 mile northeast of the last radar position. Witnesses reported that the aircraft impacted in about a 45-degree descent angle, that the engine sounded normal, and that there was low cloud cover in the area.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The noninstrument-rated pilot's continuation of VFR flight into instrument meteorological conditions which led to pilot spatial disorientation and loss of control of the aircraft. Factors were: pilot self-induced pressure, night conditions, low ceilings, and the pilot's lack of total instrument time.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: CRUISE

Findings
1. (F) WEATHER CONDITION - LOW CEILING
2. (C) VFR FLIGHT INTO IMC - CONTINUED - PILOT IN COMMAND
3. (F) SELF-INDUCED PRESSURE - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: CRUISE

Findings
4. (F) LIGHT CONDITION - DARK NIGHT
5. (C) AIRCRAFT CONTROL - UNCONTROLLED - PILOT IN COMMAND
6. (C) SPATIAL DISORIENTATION - PILOT IN COMMAND
7. (F) LACK OF TOTAL INSTRUMENT TIME - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On August 2, 1996, approximately 0119 Pacific daylight time (PDT), a Mooney M20E, N9360M, registered to Eagle Flyers, Inc. of Ashland, Oregon, collided with terrain near Purdy, Washington. The aircraft was destroyed and the private pilot, who was not instrument-rated, and one passenger were killed. The 14 CFR 91 flight was en route from Friday Harbor, Washington to Medford, Oregon on a visual flight rules (VFR) flight plan. The automated weather observation system (AWOS) at Bremerton, Washington, the closest operating weather observation facility to the accident site, reported instrument meteorological conditions (a 600-foot overcast ceiling) at 0116.

FAA air traffic service (ATS) records indicated that at 1354 on the afternoon before the accident, the pilot contacted the Seattle automated flight service station (AFSS) and requested an outlook weather briefing for a flight from Lopez Island, Washington, to Medford, Oregon, departing VFR between 0730 and 0800 the following morning. The briefing transcript indicated that the outlook at that time was for marginal VFR conditions in the morning. The pilot stated after receiving this information: "...I...may change my plans and go ahead leave out tonight...."

At 1844 on the evening before the accident, according to the FAA ATS record, the pilot again contacted Seattle AFSS and requested an outlook briefing for a Lopez Island to Medford flight, departing VFR at 0730 the following morning. He was informed by the briefer that "it's not looking too good" and was told, "you're gonna have to contend with marginal v f r conditions and rain showers if you go tomorrow...if you wait until the next day it'll probably be a lot better." The pilot asked what the conditions would be between 2100 and 2300 that evening and was given a series of observations along his route; the briefer concluded these reports by saying, "so it's excellent now and it's not gonna change in the next couple a [sic] hours." The pilot replied, "well it sounds like [I'm] gonna because [I] need to be home by tomorrow afternoon so [I] think just gonna go out and bug out tonight then." (In a telephone conversation with the passenger's father on March 13, 1997, the passenger's father stated that the pilot, who owned a bowling alley, was returning to Oregon to run a major bowling tournament at the alley which was scheduled for the day on which the accident occurred.) The pilot was then given a route briefing, and filed a VFR flight plan, for a 2300 departure. The pilot indicated at this time that one person would be on board, according to the briefing transcript. He gave his planned route of flight as: Lopez Island to Whidbey Island, Washington; LOFAL intersection (approximately 7 nautical miles north of Poulsbo, Washington); Olympia, Washington; Newberg, Oregon; Eugene, Oregon; to Medford.

At 2235, the pilot called Seattle AFSS and asked for an update to the weather conditions. The

pilot was given the update and, upon inquiring if marginal VFR conditions were still forecast for the following morning, was told that they were. The pilot then amended his proposed departure time for the 2300 flight to midnight.

At 0041, according to the FAA ATS record, the pilot contacted Seattle Radio (the radio call sign for Seattle AFSS) and activated his flight plan to Medford. Seattle Radio then informed the pilot that weather conditions in the Olympia area were deteriorating much faster than expected. The briefer relayed an automated observation from Olympia which reported an 800-foot broken ceiling with light rain, and a pilot report from an aircraft inbound from Medford to the Olympia/Tacoma Narrows area, which indicated that the pilot of that aircraft was "having a very difficult time maintaining v f r...he was dodging clouds around fifteen hundred feet and ah said that it was quite poor coming up [from Chehalis to Olympia]...." The pilot inquired about the possibility of getting above the clouds and was informed that the briefer did not have any information about cloud tops or about "being able to get above or between layers", but did report that there was an overcast layer with a base of 7,000 feet. The pilot replied: "okay roger well we'll ah we'll go down check it out if we don't like it we'll turn around and go back home."

Air traffic control (ATC) information from the FAA indicated that the pilot contacted Seattle Approach Control at 0055 over the Port Townsend, Washington, area and reported an altitude of 2,500 feet, and was instructed to advise the controller prior to changing altitude. At 0112, approximately 5 nautical miles northeast of the Bremerton airport, the pilot asked for clearance down to 1,500 feet and was cleared to maintain a VFR altitude at his discretion. Approach control radar data indicated that between 0115:20 and 0118:29, as the aircraft passed approximately 5 to 6 miles east of the Bremerton airport, the aircraft climbed from 2,600 to 3,200 feet, proceeding on a generally southerly track. The radar data indicated that the aircraft then began a descending left turn.

In this descending left turn, the aircraft's straight-line plot-to-plot average ground speed increased from 102 knots (the last ground speed computed for the aircraft in level flight heading south, at 3,200 feet) to a maximum of 181 knots (attained between 0118:43 and 0118:47), and was 174 knots between the final two radar plots. The aircraft's normal operating speed range, according to an aircraft flight manual recovered from the aircraft wreckage, is 70 to 150 MPH (61 to 130 knots) and its never-exceed speed is 189 MPH (164 knots.) The average descent rate between successive radar plots (based on altitude change versus time interval) also increased to its maximum computed value of 2,400 feet per minute between the final two plots. Calculation of aircraft performance parameters, based on radar data, further revealed that the aircraft's plot-to-plot average vertical flight path angle increased to its maximum of 7.75 degrees below horizontal, and the aircraft's plot-to-plot average horizontal rate of turn increased to 7.09 degrees per second, between the final two radar plots. The last position recorded on Seattle Approach Control's radar was at 0118:52 at an altitude of 2,700 feet.

A transcript of communications between the pilot and approach control indicated that at 0118:56 (four seconds after the last Seattle Approach radar return), the pilot called: "seattle

[sic] center this is mooney [sic] nine three six zero mike (unintelligible) some help right". In listening to a copy of the tape furnished by the FAA, it was noted that the pilot's voice pitch and speech rate were noticeably higher during the final transmission than during his previous transmissions. There were no further transmissions from the aircraft. The aircraft crashed in a residential yard approximately 1/2 mile northeast of the last Seattle Approach radar position. The accident site was approximately 6 nautical miles left of course, as compared to the route of flight filed by the pilot with Seattle AFSS.

A Pierce County sheriff's deputy who was in the area at the time reported that he observed "what initially appeared as a meteor streaking down at an approx[imate] 45 [degree] angle....for a fraction of a second", then "a red/orange flash (appeared small) just prior to the trajectory of the streak reaching treetop level" followed by "a large red/orange fireball which extended above the treeline momentarily and then receded to an orange glow above the trees...." Another Pierce County sheriff's deputy, who lives just north of the accident site and had arrived at his home just before the accident, heard what he described as "a plane approaching from the south at an obviously low altitude." This deputy stated: "The engine sounded as though it was working properly and I noted no unusual noises nor did I detect any initial explosions on its approach." He also reported that "there was a light drizzle and low cloud cover in the area at the time." He stated: "The engine sound grew louder and closer. For...2-3 seconds, the engine noise stopped. I then heard a loud explosion followed a couple of seconds later by the glow of a fireball over the treetops."

The accident occurred during the hours of darkness at approximately 47 degrees 23 minutes North and 122 degrees 39 minutes West.

OTHER DAMAGE

A post-crash fire burned a utility pole and heat-damaged a parked car near the point of impact.

PERSONNEL INFORMATION

The pilot was issued his private pilot certificate on June 8, 1995, approximately 14 months before the accident. Partial sections of the pilot's logbook were recovered from the aircraft wreckage. These sections were burned and dispersed around the wreckage area, but enough legible sections were recovered to indicate (upon reconstruction of the logbook by investigators) that the pilot had logged 123.5 hours total time (46.6 in the accident aircraft) including 63.8 hours pilot-in-command (43.7 in the accident aircraft). The pilot had also logged 14 hours at night (including 2 within the last 90 days) and 3 hours of simulated instrument time (none within the last 90 days). The pilot did not hold an instrument rating.

AIRCRAFT INFORMATION

A review of copies of airworthiness directive (AD) compliance logs filed with the aircraft logbooks revealed no documentation of compliance with FAA AD 73-21-01 since 1992. This

AD mandates lubrication of all flight control systems at intervals not to exceed 12 calendar months or 100 hours in service from the last inspection, whichever comes first. The aircraft logbook indicated that the last annual inspection had been completed, and the aircraft certified as airworthy, on September 5, 1995.

METEOROLOGICAL INFORMATION

The 0116 Bremerton automated weather observation reported a 600-foot overcast ceiling with 10 statute miles visibility. An encoded remark in the observation, "A01", indicated that it was an automated observation without a precipitation discriminator. According to the U.S. Government Airport/Facility Directory (A/FD), Bremerton is equipped with an AWOS-3 Automated Weather Observation System (which is capable of reporting visibility and cloud/ceiling data) and broadcasts observations on 121.2 MHz. According to FAA radar data, at the time of the 0116 observation N9360M was approximately 6 nautical miles southeast of Bremerton and 2 to 3 nautical miles north of the crash site, and was at an altitude of 2,900 to 3,000 feet. A review of the Bremerton observation sequence revealed that the reported ceiling there dropped from 2,600 feet overcast at 0056 to 600 feet overcast at 0116.

WRECKAGE

The aircraft wreckage was examined at the accident site on August 2, 1996. The crash site was located in a level residential yard in front of two houses. The aircraft was disintegrated; however, the engine, all three propeller blades, the tail, and sections of both wings were found at the site. A crater approximately 6 feet wide and 3 feet deep contained two of the propeller blades and numerous other aircraft pieces; the engine, standing on end, and the third propeller blade were located on the western edge of this crater. The left aileron counterweight was found 14 feet east of the crater, and the pitot tube, which was buried, was located 8 feet east of the crater. The remainder of the aircraft wreckage was distributed in a sector approximately 135 degrees wide, extending from the crater and centered on a bearing of about 280 degrees magnetic from the crater. Pieces of the aircraft were found as far away as 280 feet from the crater. There was also wreckage (including a section of wing skin, the cabin and baggage doors, clothing, a sleeping bag, and a tent) suspended in tree branches west and southwest of the crater up to about 20 feet above ground level. The largest pieces of wreckage were the empennage, located 24 feet southwest of the crater, and a section of the right wing and fuselage located adjacent to, and northwest of, the empennage. A wooded area between two parallel roads west of the crater was burned. Examination of the three propeller blades revealed tip curl, chordwise scratching, "S" bending, and torsional twisting on the blades.

A reconstruction and re-examination of the aircraft wreckage was conducted at Pierce County Airport-Thun Field, Puyallup, Washington, on August 6, 1996. During the re-examination, investigators found no evidence of malfunction in the airframe or engine.

FIRE

A post-crash fire was witnessed. The fire damaged a utility pole and scorched a car parked in a driveway adjacent to the impact point. Numerous aircraft components displayed fire damage at the accident site. During the August 6 wreckage re-examination, investigators examined the wreckage for evidence of inflight fire and none was found.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies on the pilot and passenger were conducted by the Pierce County Medical Examiner's Office, Tacoma, Washington, on August 3, 1996. The cause of death for both aircraft occupants was given as "multiple injuries." The autopsy report on the pilot stated that a portion of the pilot's respiratory tract which was examined showed no gross soot.

Toxicology tests on the pilot and passenger were performed by the FAA Civil Aeromedical Institute (CAMI), Oklahoma City, Oklahoma. The CAMI toxicology tests found no ethanol or drugs in the pilot. CAMI reported that they did not test either occupant for carboxyhemoglobin or cyanide due to lack of suitable specimens.

ADDITIONAL INFORMATION

The aircraft wreckage was released to Mr. James V. Stiger of Barrus & Stiger, Bellevue, Washington, on March 26, 1997. Mr. Stiger is the insurance adjuster representing the aircraft owner.

Pilot Information

Certificate:	Private	**Age:**	36,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	October 11, 1995
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	124 hours (Total, all aircraft), 47 hours (Total, this make and model), 64 hours (Pilot In Command, all aircraft), 23 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N9360M
Model/Series:	M20E M20E	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1292
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	September 5, 1995 Annual	**Certified Max Gross Wt.:**	2575 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	IO-360-A1A
Registered Owner:	EAGLE FLYERS INC.	**Rated Power:**	200 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Unknown	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	PWT ,439 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	01:16 Local	**Direction from Accident Site:**	305°
Lowest Cloud Condition:	Unknown	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	13°C / 8°C
Precipitation and Obscuration:			
Departure Point:	FRIDAY HARBOR , WA (FHR)	**Type of Flight Plan Filed:**	VFR
Destination:	MEDFORD , OR (MFR)	**Type of Clearance:**	VFR on top
Departure Time:	00:40 Local	**Type of Airspace:**	Class E

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	Unknown
Total Injuries:	2 Fatal	**Latitude, Longitude:**	47.360382,-122.599388(est)

Administrative Information

Investigator In Charge (IIC):	Nesemeier, Gregg
Additional Participating Persons:	BILL REICHARDT; RENTON , WA JEFF POSCHWATTA; KENT , WA
Original Publish Date:	March 31, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=42283