

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# GAA17CA285	05/15/2017 1130	Regis# N319BM	Dumas, TX	Apt: N/a
Acft Mk/Mdl AIR TRACTOR INC AT 802		Acft SN 802A-0160	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl PRATT & WHITNEY PT6A-67AG		Acft TT 4045	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 137
Opr Name: TIGER AVIATION LLC		Opr dba:		Aircraft Fire: NONE
				AW Cert: SPR

Summary

The pilot reported that, while maneuvering at a low altitude during an agricultural application flight, a wind gust lifted the right wing and the left wing descended striking the "wheat" crop. Subsequently, the airplane was "sucked" into the wheat, and it then impacted the ground and came to rest inverted.

The airplane sustained substantial damage to the fuselage and both wings.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The automated weather observation system about 4 nautical miles from the accident site, about the time of the accident, reported that the wind was from 160ø at 13 knots.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain lateral control while maneuvering at a low altitude.

Events

1. Maneuvering-low-alt flying - Loss of control in flight
2. Maneuvering-low-alt flying - Collision with terr/obj (non-CFIT)
3. Other - Nose over/nose down

Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Lateral/bank control-Not attained/maintained - C
3. Environmental issues-Conditions/weather/phenomena-Wind-Gusts-Effect on operation
4. Environmental issues-Physical environment-Object/animal/substance-(general)-Contributed to outcome

Narrative

The pilot reported that while maneuvering at a low altitude during an aerial application flight, a gust of wind lifted the right wing and the left wing descended striking the "wheat" crop. Subsequently, the airplane was "sucked" into the wheat, the airplane impacted the ground and came to rest inverted.

The airplane sustained substantial damage to the fuselage and both wings.

The pilot reported that there were no pre-accident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The automated weather observation system about 4 nautical miles from the accident site, about the time of the accident, reported the wind at 160ø at 13 knots.

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Accident Rpt# GAA17CA342 06/15/2017 1330 CDT Regis# N915AJ Pocahontas, AR Apt: N/a
Acft Mk/Mdl AIR TRACTOR INC AT 802 Acft SN 802A-0566 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 137
Opr Name: C&C FLYING SERVICE INC Opr dba: Aircraft Fire: NONE

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Accident Rpt# ERA16CA302	07/20/2016 1830 EDT	Regis# N46CE	Burnsville, NC	Apt: Mountain Air Airport 2NC0
Acft Mk/Mdl BEECH B200-UNDESIGNAT		Acft SN BB1492	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl PRATT AND WHITNEY PT6A-61		Acft TT 1838	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: CENTURY EQUIPMENT COMPANY INC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

Summary

The pilot stated that, during approach to the 50-ft-wide runway in his airplane, which had a 54.5-ft wingspan, he maintained a left-wing-low attitude to account for a left crosswind and touched down 1 to 2 ft right of the runway centerline. While correcting toward the runway centerline, the right wing collided with a bush located off the right side of the runway, which resulted in substantial damage to the right aileron. The pilot indicated there was nothing mechanically wrong with the airplane that caused the collision and that he had flown into the same airstrip between 30 and 50 times. Following the accident, the bush was removed.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A collision with a bush during landing.

Events

1. Landing-landing roll - Airport occurrence
2. Landing-landing roll - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Environmental issues-Physical environment-Object/animal/substance-Tree(s)-Effect on operation - C

Narrative

The pilot stated that during approach to the 50-foot-wide runway, in his airplane which had a 54.5-foot wingspan, he maintained a left wing low attitude to account for a crosswind from the left and touched down 1 to 2 feet right of the runway centerline. While correcting towards the runway centerline, the right wing collided with a bush located off the right side of the runway resulting in substantial damage to the right aileron. He indicated there was nothing mechanically wrong with the airplane that caused the collision, and that he had flown into the same airstrip between 30 and 50 times. Following the accident, the bush was removed.

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Accident Rpt# GAA17CA355	06/21/2017 850 PDT	Regis# N6180A	Williams, CA	Apt: N/a
Acft Mk/Mdl BELL UH1B		Acft SN 62-1994	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 137
Opr Name: JONES AVIATION INC		Opr dba:		Aircraft Fire: NONE

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Incident Rpt# ENG17IA026	06/07/2017 950 UTC	Regis# N668US	Tokyo, JA		
Acft Mk/Mdl BOEING 747 451-451		Acft SN 24223	Acft Dmg: MINOR	Rpt Status: Prelim	Prob Caus: Pending
Eng Mk/Mdl P&W PW4000 SER			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 121	
Opr Name: DELTA AIR LINES		Opr dba:		Aircraft Fire: NONE	

Events

1. Enroute-cruise - Loss of engine power (total)
-

Narrative

On June 6, 2017, about 0950 UTC, Delta Air Lines flight 276, a Boeing 747-400, N668US, experienced a loss of power during cruise flight from the No. 1 engine, a Pratt & Whitney PW4056 while in cruise flight over the Pacific Ocean. The flight crew reported the airplane was level at FL 320 when they heard a thump that was followed by a yawing of the airplane as the exhaust gas temperature increased to redline and then the engine auto shutdown. The flight crew declared an emergency and deviated from the track as the airplane descended to FL280 where they accomplished the checklist items. After consultation with dispatch and maintenance, the flight crew diverted back to Tokyo Narita International Airport (NRT), Japan where it landed without further incident. The post landing examination of the engine revealed metal in the tailpipe and a 360 degree crack in the low pressure turbine case just forward of the rear flange. The airplane was operating on an instrument flight rules flight plan under the provisions of 14 Code of Federal Regulations Part 121 as an international passenger flight from NRT to Detroit, Michigan. There were no injuries to the 4 pilots, 14 flight attendants, and 309 passengers on board.

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Accident Rpt# CEN14LA430	08/09/2014 734 CDT	Regis# N943LR	San Antonio, TX	Apt: San Antonio Intl SAT
Acft Mk/Mdl BOMBARDIER CL600 2D24 - 900		Acft SN 15068	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl GENERAL ELECTRIC CF34-8C5		Acft TT 12283	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 121
Opr Name: MESA AIRLINES INC		Opr dba: AMERICAN EAGLE		Aircraft Fire: NONE
				AW Cert: STT

Events

1. Pushback/towing - Ground collision
-

Narrative

On August 9, 2014, about 0735 central daylight time (CDT), a Bombardier CL600 airplane, N943LR, collided with a tug during pushback from the gate at San Antonio International Airport (SAT) San Antonio, Texas. The airplane sustained substantial damage to the fuselage structure and internal damage to nose landing gear. The airplane was registered to and operated by Mesa Airlines Inc. as US Airways flight 2763. The four flight crewmembers and passengers on-board were not injured. Visual meteorological conditions prevailed at the time of the accident and the flight operated on a instrument flight rules flight plan. The scheduled, domestic passenger flight was operated under the provisions of 14 Code of Federal Regulations Part 121. The flight was destined for Phoenix Sky Harbor International Airport (PHX), Phoenix, Arizona.

The first officer reported the tug driver did not have an operable headset and the pushback was initiated using hand signals. The airplane was positioned on the ramp at a 90-degree angle to the gate. The tug driver stated after turning the airplane onto the taxiway he "reversed back," pulling the airplane forward. The tug stopped perpendicular to the left nose of the airplane, but the airplane continued to roll forward while still attached to the tow bar. The airplane rolled into the tug impacting the left side of the fuselage.

Examination revealed the tow bar shear pin had failed, but the investigation could not determine if the shear pin failed prior to or during the pushback process.

In accordance with company policies and procedures, a postaccident drug test of the tug driver was administered about 9 hours after the accident, which was positive for marijuana. According to 49 CFR Part 40 Section 40.87, the initial test cut off is 50 ng/ml, but a positive marijuana test can be reported if the confirmatory test identifies 15 ng/ml or more of marijuana metabolite (tetrahydrocannabinol carboxylic acid, or THC-COOH) in urine. According to the NTSB Medical Officer, about 30% of THC is eventually excreted in urine, primarily as THC-COOH. However, its presence in urine only indicates prior THC exposure. After smoking marijuana, it can take as long as four hours for THC-COOH to appear in the urine at concentrations above the initial reporting cut off of 50 ng/ml. Positive urine test results generally indicate use within hours to a few days; however, the detection window can be significantly longer following chronic, heavy use.

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Incident Rpt# ENG17IA028	06/10/2017 1750 CDT	Regis# N715SK	Chicago, IL		
Acft Mk/Mdl BOMBARDIER INC CL 600 2C10-700C		Acft SN 10179	Acft Dmg: MINOR	Rpt Status: Prelim	Prob Caus: Pending
Eng Mk/Mdl GE CF34 SERIES			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 121	
Opr Name: SKYWEST AIRLINES INC		Opr dba:		Aircraft Fire: NONE	
				AW Cert: STC	

Events

1. Takeoff - Powerplant sys/comp malf/fail

Narrative

On June 10, 2017, at about 1750 central daylight time, a SkyWest Airlines Bombardier CRJ700, N715SK, experienced an uncontained No. 1 engine failure during takeoff from Chicago O'Hare International Airport (ORD)- Chicago, Illinois. The crew reported hearing a loud bang, followed by a reduction in power, and a No. 1 engine fire warning. The crew declared an emergency and returned to ORD for an uneventful landing. Aircraft rescue and firefighting (ARFF) crews met the airplane on the runway. ARFF did not observe fire or smoke, and the airplane was cleared to taxi to the gate. There were no injuries reported to the passengers or crew. The flight was being operated in accordance with 14 Code of Federal Regulations Part 121 and was a regularly scheduled flight from ORD to Bishop International Airport (FNT)- Flint, Michigan.

A preliminary visual inspection of the No. 1 engine was conducted by maintenance crews at ORD and extensive turbine damage and a large hole in the cowl were reported. Multiple small impact marks were observed on the fuselage, aft of the No. 1 engine.

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Accident Rpt# GAA17CA332	05/24/2017	830 ADT	Regis# N1265U	Elfen Cove, AK	Apt: Elfin Cove ELV
Acft Mk/Mdl CESSNA 208-A			Acft SN 20800375	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim Prob Caus: Pending
			Acft TT 2338	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 135
Opr Name: KALININ PARTNERS LLC.			Opr dba:		Aircraft Fire: NONE

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Accident Rpt# ANC16LA012	01/02/2016	1205 AKS	Regis# N540ME	Anaktuvuk Pass, AK	Apt: Anaktuvuk Pass AKP
Acft Mk/Mdl CESSNA 208B			Acft SN 208B-0540	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl P&W CANADA PT6A-6 SERIES			Acft TT 19555	Fatal 0 Ser Inj 5	Flt Conducted Under: FAR 135
Opr Name: WRIGHT AIR SERVICE INC			Opr dba:		Aircraft Fire: NONE
					AW Cert: STN

Events

1. Enroute - Controlled flight into terr/obj (CFIT)

Narrative

HISTORY OF FLIGHT

On January 2, 2016, about 1205 Alaska standard time, a single-engine, turbine-powered Cessna 208B airplane, N540ME, impacted mountainous, snow-covered terrain about 6 miles southwest of Anaktuvuk Pass Airport, Anaktuvuk Pass, Alaska. The airline transport pilot and four passengers sustained serious injuries, and three passengers sustained minor injuries. The airplane sustained substantial damage. The airplane was being operated by Wright Air Service, Inc., Fairbanks, Alaska, as a 14 Code of Federal Regulations Part 135 visual flight rules (VFR) scheduled commuter flight. Visual meteorological conditions (VMC) existed at the Anaktuvuk Pass Airport at the time of the accident, and company flight-following procedures were in effect. The flight departed from Fairbanks International Airport, Fairbanks, Alaska, about 1030 destined for Anaktuvuk Pass. The area between Fairbanks and Anaktuvuk Pass consists of remote, steep mountainous terrain, which is snow-covered in January.

Following the accident, the pilot stated that, after receiving a weather briefing in the morning from the Federal Aviation Administration (FAA) Flight Service Center, he chose to conduct the flight under VFR. He reported that, while en route to Anaktuvuk Pass about 10,000 ft mean sea level (msl), the visibility began "getting fuzzy" as he flew over the Caribou Hills. He then descended to 2,500 ft msl (or 500 ft above ground level) to fly along the John River. When the airplane was about 10 miles southwest of Anaktuvuk Pass, he climbed to about 3,000 ft msl to be at the published airport traffic pattern altitude while maintaining a flight track on the east side of the river valley to conduct a straight-in approach to runway 2. He added that the visibility was again a little "fuzzy"; that there was snow, white walls, and white clouds; and that he never saw the airport. The pilot noted that the flat light conditions limited his ability to determine his distance from the surrounding snow-covered, mountainous terrain. Shortly after climbing to 3,000 ft msl, the airplane collided with the rising snow-covered terrain about 6 miles southwest of the Anaktuvuk Pass Airport. The pilot stated that he did not remember any ground proximity warning system alerts before the collision. In a subsequent written statement, the pilot reported no preimpact mechanical failures or malfunctions with the airframe or engine that would have precluded normal operation.

The airplane's Spidertracks flight tracking system transmitted flight tracking data every 2 minutes. A review of the data revealed that the airplane's last reported location was along the east side of the John River valley at an altitude of 2,560 ft msl on a ground track of about 48ø.

Immediately following the accident, a passenger used a cell phone to call for rescue from Anaktuvuk Pass residents. About 20 minutes later, rescue personnel located the airplane and began extricating passengers from the wreckage and transporting them via snow machine to Anaktuvuk Pass for medical attention.

PERSONNEL INFORMATION

The pilot, age 57, held an airline transport pilot certificate with airplane single-engine land and multiengine land ratings. The pilot was issued a first-class airman medical certificate on October 1, 2015 with the limitation that he must have available glasses for near vision.

The accident pilot completed CFIT avoidance training on May 26, 2015. On November 21, 2015 the pilot successfully completed an airman competency and proficiency check in accordance with 14 CFR 135.293 and 135.297 which included CFIT avoidance.

AIRCRAFT INFORMATION

The accident airplane, a Cessna 208B, N540ME, was manufactured in 1996. At the time of the last inspection on December 9, 2015, the airplane had logged a total time in service of 19,555.4 flight hours.

The airplane was equipped with a Pratt & Whitney Canada PT6A-114A, 675 shaft horse power turbine engine. The engine had a total time in service of 8,915.4

hours, of which 3,542.4 hours were since the last overhaul.

The airplane was equipped with a Terrain Awareness Warning System (TAWS). The pilot did not recall inhibiting the system, which required navigation through several data pages within the GPS unit. The airplane was not equipped with a remote inhibit switch and due to system design and a lack of non-volatile memory, the status of the system could not be determined post-accident.

METEOROLOGICAL INFORMATION

The closest weather reporting facility was Anaktuvuk Pass Airport, located about 6 miles northeast of the accident site. At 1156, a METAR was reporting, in part, wind from 170ø at 5 knots; sky condition, broken clouds at 4,400 ft, overcast at 5,000 ft; visibility 6 statute miles; temperature 19øF, dew point 12øF; and altimeter setting 29.03 inches of mercury.

The FAA maintained weather cameras at Anaktuvuk Pass, which recorded images to the northeast, southeast, south, and southwest; the site elevation was 2,171 ft msl. A review of the recorded images revealed deteriorating weather conditions about the time of the accident. The south-facing camera showed that, between 1152 and 1212, the visibility was less than 2 miles, that ceiling conditions were below 4,100 ft msl, and that snow was falling. Weather conditions improved slightly by 1222 with visibility greater than 2 miles but less than 4 miles and a broken cloud ceiling. Overall, the camera images showed that, although conditions were marginal VFR at the surface at the time of the accident, there was mountain obscuration and reduced visibility due to light snow and clouds along the accident flightpath and that the worst conditions existed along and near the higher terrain at the time of the accident. The pilot reported that he did not check the FAA weather cameras before departure because it was dark at Anaktuvuk Pass at the time of departure.

Another pilot who had just departed from Anaktuvuk Pass reported that he contacted the accident pilot as he was approaching the airport and stated that the weather was "pretty much as advertised." The other pilot added that he had encountered flat light conditions after departing Anaktuvuk Pass, which was "compounded by low visibility," and that, to remain in VMC, he had to turn toward the north side of the valley and initiate a climb. The pilot stated that he perceived that the flat light and low-visibility conditions were highly localized.

FLIGHT RECORDERS

The accident airplane was not equipped, nor was it required to be equipped with, a cockpit voice recorder or a flight data recorder.

WRECKAGE AND IMPACT INFORMATION

On January 3, two FAA aviation safety inspectors traveled to Anaktuvuk Pass and reached the accident site that morning. The inspectors reported that the main wreckage was in an open area of snow-covered tundra at an elevation of about 2,500 ft msl. The top of the ridge where the airplane impacted was at an elevation of about 3,000 ft msl. From the initial point of impact, the airplane slid downhill about 300 ft and then came to rest in an upright position. The FAA inspectors reported finding a 1/2-inch layer of ice on the nonprotected, leading edge surfaces of the tail structure and outside air temperature probe. However, no ice was present on the areas protected by the inflatable deice boots.

The airplane wreckage was further examined by the NTSB IIC, two Textron Aviation air safety investigators, and a representative from the operator. The examination revealed that the airplane had sustained substantial damage to the fuselage, wings, and empennage. Flight control primary and secondary cable continuities were established from the cockpit controls to the respective flight control bell cranks and trim surface actuators. The flight control surfaces remained attached to the airplane except for the left aileron, which was separated outboard of the inboard hinge. The left aileron control rod was separated. The separated left aileron was observed during the initial on-scene examination, but due to recent snowfall, the remaining portion of aileron was not recovered with the airplane wreckage. The pitch trim actuator extensions were altered at the accident site to facilitate recovery. The aileron trim actuator was found in the "neutral" position. The flap actuator screw jack extension indicated that the flaps were retracted. The engine had separated from the firewall at the attachment points. Rotational scarring at the propeller hub attachment points were consistent with the engine operating at the time of impact.

The examination revealed no preimpact mechanical malfunctions or anomalies with the airplane or engine that would have precluded normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

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The FAA's Civil Aerospace Medical Institute performed toxicological testing on specimens from the pilot on February 12, 2016 which was negative for ethanol and drugs.

ADDITIONAL INFORMATION

Medallion Foundation

According to the Medallion Foundation Shield Program website, the purpose of the Shield Program was to create and maintain a higher level of safety through the use of system safety and safety management system principles. An applicant needed to earn a "star" in each of the following categories to earn a shield:

- Controlled flight into terrain (CFIT) avoidance
- Operational control
- Maintenance and ground service
- Safety
- Internal evaluation

To earn a star, an applicant organization had to complete specific training classes, produce a required manual, and undergo an external audit to determine if the company had incorporated the information into its corporate culture. Following the initial audit, annual independent audits were to be conducted.

According to the Medallion website, the benefits of being a Shield carrier "include reduced insurance rates, cross promotional marketing of Shield carriers and recognition by DOD [Department of Defense], OGP [Oil and Gas Producers] and the FAA as an operator who incorporates higher standards of safety than required by regulations."

At the time of the accident, Wright Air Service was the holder of a CFIT avoidance "star."

Flat Light Conditions

In the FAA publication titled, "Flying in Flat Light and White Out Conditions," flat light is defined as an optical illusion that causes pilots to lose their depth perception and contrast in vision. It states that flat light can completely obscure features of the terrain, creating an inability to distinguish distances and closure rates.

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Accident Rpt# ERA16FA035	11/09/2015 1016 EST	Regis# N164GP	Climax, GA	Apt: Cairo-grady Co 70J
Acft Mk/Mdl CESSNA 441-NO SERIES		Acft SN 441-0164	Acft Dmg: DESTROYED	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl GARRETT RESEARCH TPE331-10		Acft TT 18423	Fatal 2 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: LEGAL AIRWAYS LLC		Opr dba:		Aircraft Fire: GRD
				AW Cert: STN

Events

1. Approach-circling (IFR) - Loss of control in flight

Narrative

HISTORY OF FLIGHT

On November 9, 2015, at 1016 eastern standard time, a Cessna 441, N164GP, was destroyed during collision with trees, terrain, and a post-crash fire following a loss of control while maneuvering near Climax, Georgia. The commercial pilot/owner and the commercial pilot-rated passenger were fatally injured. Instrument meteorological conditions (IMC) prevailed, and an instrument flight rules (IFR) flight plan was filed for the personal flight, which departed Lakeland Linder Regional Airport (LAL), Lakeland, Florida, at 0906, and was destined for Cairo-Grady County Airport (70J), Cairo, Georgia. The flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

The purpose of the flight was to pick up two passengers employed by the pilot's firm and return to LAL. Radar and voice communication information from the Federal Aviation Administration (FAA) revealed that the pilot contacted Tallahassee Approach Control at 0948:42 while he was descending the airplane from 5,200 to 4,000 ft mean sea level (msl). The airplane was 62 nautical miles (nm) from and flying direct to 70J. The pilot informed the controller that he was trying to "get to" visual meteorological conditions (VMC) and that, if he could not get to VMC, he would request the RNAV RWY 31 approach at 70J.

The controller advised the pilot that weather was not available for the destination airport but that two airports in the vicinity were both reporting instrument meteorological conditions. The pilot acknowledged and requested the RNAV RWY 31 approach at 70J, and the controller then instructed him to maintain 3,200 ft msl. The controller asked the pilot if he could proceed directly to the Greenville VOR, which was the initial approach fix (IAF) for the RNAV RWY 31 approach, and the pilot responded that he was "loading it."

At 0953:43, while the airplane was at 3,300 ft msl and 33 nm from 70J, the pilot reported that he had the destination airport in sight and cancelled his IFR flight plan. The controller then issued a frequency change to the common traffic advisory (CTAF) frequency at 70J but offered the pilot the option to stay on the approach frequency until the airplane got closer to its destination. The pilot reported that he was "VFR" and changed radio frequencies to the CTAF.

Radar data showed that, during the next 13 minutes, the airplane's radar track displayed an erratic sequence of left, right, and 360° turns that took the it away from the destination airport in a westerly direction at altitudes between about 4,000 and 900 ft msl.

At 1006:16, the pilot contacted air traffic control (ATC) on the approach control frequency, reported that he had lost visual contact with the airport, and requested the RNAV RWY 13 approach at 70J. The controller then provided a sequence of heading and altitude assignments to vector the airplane to the OCAPE waypoint, which was the IAF for the requested approach. The airplane did not maintain its heading and altitude assignments, and ATC provided several corrections to the pilot.

At 1012:31, the controller instructed the pilot to proceed directly to OCAPE and join the approach. Over the next 3 minutes, the pilot stated that he was unable to identify OCAPE and asked the controller for the correct spelling so he could "load it." At 1015:37, the pilot acknowledged the approach clearance. No further transmissions were received from the pilot.

Subsequently, radar data showed that the airplane climb and descend in the vicinity of OCAPE, and at 1016:40, the airplane entered a descending right turn at 2,500 ft msl and 180 knots groundspeed, at which point radar contact was lost.

PERSONNEL INFORMATION

The pilot/owner held a commercial pilot certificate with ratings for airplane single-engine land, multiengine land, rotorcraft helicopter, and instrument airplane. His most recent FAA third-class medical certificate was issued on May 30, 2013. At that time, the pilot reported 1,150 total hours of flight experience.

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The pilot-rated passenger held a commercial pilot certificate with ratings for airplane single-engine land, multiengine land, rotorcraft helicopter, and instrument airplane and helicopter. His most recent FAA second-class medical certificate was issued on December 4, 2014. At that time, he reported 9,500 total hours of flight experience.

AIRCRAFT INFORMATION

According to FAA and maintenance records, the airplane was manufactured in 1980 and was equipped with two 715-horsepower Garrett Research TPE331-8-402S turboprop engines. The most recent phase inspections were completed on April 25, 2014, at 18,422.8 total aircraft hours. The airframe logbook entry documenting those phase inspections noted that 3 subsequent phase inspections were due in September 2014, with an additional phase inspection due in September 2015. No additional phase inspections had been logged. The final airframe logbook entry dated September 22, 2015, indicated that the airplane had accrued 18,513.7 total aircraft hours.

An aircraft maintenance facility at the pilot's home airport (LAL) maintained the accident airplane, the other airplanes in the pilot's fleet, and their collective maintenance records. The owner and president of the maintenance company, an airframe and powerplant mechanic, provided a detailed maintenance and event history on the accident airplane and the rest of the pilot's fleet.

The airplane was purchased from Australia, and the engines were on an approved operator's maintenance program there. Once purchased and brought to the United States, the airplane's engines were due for overhaul. They were subsequently removed at LAL, overhauled in Ohio, then reinstalled at LAL. The engine overhauls were not completed at the same time, so the pilot/owner requested that the overhauled engine be installed along with a rental engine.

On the first flight after installation, the pilot aborted the first takeoff, closed the throttles, feathered the propellers, and then attempted an engine restart. The pilot's actions were contrary to the checklist and resulted in damage to the compressor section of the overhauled engine.

In June 2014, new, metal, four-bladed propellers were installed on the airplane at the owner's request. No one was immediately available to conduct the mandatory postinstallation test flight, so he chose to start and taxi the airplane forward and backward by himself over the course of 2 days. At one point, he attempted to move a propeller out of the feather position by motoring the starter, which destroyed the starter and melted its wiring harness.

On another occasion, the pilot identified an engine exhaust gas temperature (EGT) gauge as inoperative, and requested troubleshooting from the mechanic. The mechanic arrived "several times" to investigate, and each time the pilot was flying the airplane. When asked about why the airplane was operating with an inoperative EGT gauge, the pilot's assistant, who was also the copilot on the accident flight, told the mechanic that the pilot "knows" the EGT based on fuel flow.

The mechanic reported that the pilot often taxied the airplane out of its hangar using reverse thrust because the use of a tug was "too much trouble."

Lastly, the mechanic advised the pilot through his copilot/assistant of the due dates for mandatory inspections on the airplane, but the airplane was operated continuously for several months, and about 100 flight hours, beyond the due dates up to the day of the accident. When asked why the mandatory inspections were not conducted, the copilot/assistant explained that because the pilot's other twin-engine airplane was down for maintenance, he would not have both "down for maintenance at the same time."

When asked if the database in the panel-mounted GPS was up to date on the airplane at the time of the accident, the mechanic responded that "nothing on that airplane was up to date."

METEOROLOGICAL INFORMATION

The 1015 weather observation at Decatur County Industrial Airpark (BGE), 8 miles west of the accident site, included wind from 050 at 10 knots, an overcast ceiling at 400 ft, 2 miles visibility in fog, temperature 16°C, dew point was 15°C, and an altimeter setting of 30.04 inches of mercury.

Weather observations at airports surrounding the accident site reported cloud ceilings between 200 and 800 ft above ground level (agl). Photographs taken a few minutes before the accident by a passenger waiting at the destination airport showed a ceiling estimated to be between 200 and 250 ft agl with mist and fog

in the treetops.

The pilot received an official weather briefing from Lockheed Martin Flight Service (LMFS) by phone at 0830. During his weather briefing, the pilot and the briefer discussed how the pilot had "looked up" the latest weather conditions, a SIGMET along his route of flight, a center weather advisory for rain, embedded thunderstorms, and low IMC. The LMFS weather briefer told the accident pilot that "it's pretty bad out there." The pilot then requested the closest terminal area forecast and mentioned that he might "give it an hour before taking off, as it sounds like things are clearing out." Instead, the pilot departed about 30 minutes later. The pilot did not file an alternate airport in his flight plan.

A center weather advisory for IFR conditions was in effect for the area surrounding the destination airport at the time of the accident, and upper air balloon data showed a solid cloud layer that reached about 2,500 ft msl over the southeastern United States. Clouds above that layer were likely between 5,000 and 12,000 ft msl.

WRECKAGE INFORMATION

The wreckage was examined at the accident site on November 10, 2015. There was a strong odor of fuel, and all major components of the airplane were accounted for at the scene. The wreckage path was oriented along a magnetic heading of about 175° and was about 150 ft long and about 45 ft wide. The initial impact point was in a 60-ft-tall tree, and the airplane impacted several other trees before impacting the ground about 24 ft beyond the first tree strike. Several pieces of angularly cut wood were found throughout the length of the debris field.

The airplane was fragmented and scattered along the length of the wreckage path. Control continuity to the wings, rudder, and elevator was confirmed through the control cables and bellcranks to the cockpit area.

The cockpit, cabin area, and empennage were destroyed by impact forces and postcrash fire and were found entangled about 48 ft down the wreckage path. The engines and their respective propeller assemblies were entangled with the main wreckage and were severely damaged by impact and fire. All four propeller blades exhibited similar twisting, bending, leading and trailing edge gouging, and chordwise scratching. The tips of each blade on one propeller system were melted away by fire. One propeller blade tip was fractured and found 215 ft southeast of the main wreckage. The compressor and power turbine sections of both engines were exposed, and the compressor tips were all bent opposite the direction of rotation. Metal spray deposits were observed on the suction side of the third-stage stator vanes.

AIRPORT INFORMATION

The field elevation at 70J was 264 ft msl. The single runway, oriented 13/31, was 4,000 ft long by 75 ft wide. The airport was not tower-controlled. The lateral navigation minimum descent altitude for the RNAV GPS RWY 13 approach was 860 ft msl.

MEDICAL AND PATHOLOGICAL INFORMATION

The Division of Forensic Sciences, Georgia Bureau of Investigation, performed an autopsy on the pilot. The autopsy report stated that the cause of death was "blunt force injuries."

The FAA Bioaeronautical Research Sciences Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on specimens from the pilot. The testing identified 0.203 gm/dl of ethanol, N-propanol, amphetamine, 0.6 ug/g of tramadol, and its active metabolite O-desmethyltramadol in the muscle tissue. In addition, tetrahydrocannabinol (THC), the active compound in marijuana, and its metabolite, tetrahydrocannabinol carboxylic acid (THC-COOH) were found in the lung tissue. Cetirizine and THC-COOH were identified in the kidney tissue. Finally, 0.044 gm/dl of ethanol, doxylamine, 1.976 ug/g of tramadol, O-desmethyltramadol, and THC-COOH were found in the liver tissue.

Ethanol may be detected due to ingestion, or it may be produced in body tissues by postmortem microbial activity. Ethanol significantly impairs pilots' performance even at very low levels. Federal Aviation Administration regulations prohibits any person from acting or attempting to act as a crewmember of a civil aircraft while having 0.040 gm/dl or more ethanol in the blood. N-propanol is another type of alcohol that is produced in body tissues after death.

Amphetamine is a prescription medication used to treat attention deficit/hyperactivity disorder and narcolepsy. It is often marketed with the name Adderall. It

carries a warning regarding the high likelihood for abuse. Tramadol is an opioid analgesic available by prescription, commonly marketed with the name Ultram. O-desmethyltramadol is created in the body by the metabolism of tramadol and has psychoactive effects. Cetirizine and doxylamine are both sedating antihistamines available in several over-the-counter products. Doxylamine is so sedating, it is primarily used as a sleep aid. Tramadol, cetirizine, and doxylamine all carry warnings regarding sleepiness and hazards to driving safety.

Medical, pharmacy, and drug rehabilitation records were requested from three different law firms handling affairs for the pilot and his estate and none were provided.

TESTS AND RESEARCH

A Garmin Aera 796 portable GPS and a Samsung Galaxy Note II personal electronic device were recovered and examined at the NTSB Recorders Laboratory in Washington, DC. Each had sustained catastrophic impact damage, and no useful data were recovered from either device.

A Garmin GNS 530 panel-mounted GPS receiver, which was the only GPS device on board the airplane that was certified for IFR navigation, was recovered and had also sustained catastrophic impact damage. The database cards were removed and placed into a surrogate receiver. On startup, the database information displayed revealed that the obstacle database expired April 8, 2010, and that the aviation database expired March 5, 2015.

ADDITIONAL INFORMATION

Maintenance and Event History of Pilot's Other Aircraft

Maintenance and event history for the pilot's Cessna 414 airplane revealed that the airplane was purchased about January 2010, and within 23 total aircraft hours, that "several" tires and broken engine mounts were replaced and that the engines were overhauled due to metal in the oil. In November 2010, both propellers were replaced due to strike damage and separated blade tips.

In July 2014, the airplane was towed from "mud" adjacent to the owner's hangar. In September 2014, the airplane was again towed from the mud adjacent to the hangar, and the airplane had again sustained propeller damage. An engine was removed and repaired due to "internal damage." Both propellers were removed and replaced with composite propellers.

The composite propellers were installed in April 2015, and in July 2015, 6.3 total aircraft hours later, the left propeller was removed and shipped to the manufacturer for repair due to tip damage. The pilot/owner would not authorize the mandatory sudden-stoppage inspection for the engine because he decided that the inspection was not required given the propellers were of composite construction.

The pilot also asked the mechanic on multiple occasions to inspect and repair damage to the airplane that included broken rudder caps, separated landing gear fairings, separated tires and tubes, and eroded propeller blades.

Spatial Disorientation

The FAA Airplane Flying Handbook (FAA-H-8083-3) described some hazards associated with flying when visual references, such as the ground or horizon, are obscured. The handbook stated that "The vestibular sense (motion sensing by the inner ear) in particular tends to confuse the pilot. Because of inertia, the sensory areas of the inner ear cannot detect slight changes in the attitude of the airplane, nor can they accurately sense attitude changes that occur at a uniform rate over a period of time. On the other hand, false sensations are often generated; leading the pilot to believe the attitude of the airplane has changed when in fact, it has not. These false sensations result in the pilot experiencing spatial disorientation."

Pilot Judgement

FAA-H-8083-2, Risk Management Handbook, identified five "hazardous attitudes" that may contribute to poor pilot judgment: antiauthority, impulsivity, invulnerability, macho, and resignation. The publication also stated,

In an attempt to discover what makes a pilot accident prone, the Federal Aviation Administration (FAA) oversaw an extensive research study on the similarities and dissimilarities of pilots who were accident free and those who were not. The project surveyed over 4,000 pilots, half of whom had "clean" records while the other half had been involved in an accident. Five traits were discovered in pilots prone to having accidents:

1. Disdain toward rules
2. High correlation between accidents in their flying records and safety violations in their driving records
3. Frequently falling into the personality category of "thrill and adventure seeking"
4. Impulsive rather than methodical and disciplined in information gathering and in the speed and selection of actions taken
5. Disregard for or underutilization of outside sources of information, including copilots, flight attendants, flight service personnel, flight instructors, and air traffic controllers.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# CEN17LA047 12/04/2016 1853 MST Regis# N332SE Gunnison, CO Apt: Gunnison-crested Butte Airport GUC
Acft Mk/Mdl CESSNA CITATION 500 Acft SN 500-0332 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl P&W JT-15D-1A Acft TT 5218 Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091
Opr Name: YATISH AIR LLC Opr dba: Aircraft Fire: NONE
AW Cert: STN

Summary

The commercial pilot of the jet reported that he initially requested that 100 lbs of fuel be added to both fuel tanks. During the subsequent preflight inspection, the pilot decided that more fuel was needed, so he requested that the airplane's fuel tanks be topped off with fuel. However, he did not confirm the fuel levels or check the fuel gauges before takeoff. He departed on the flight and did not check the fuel gauges until about 1 hour after takeoff. He stated that, at that time, the fuel gauges were showing about 900-1,000 lbs of fuel per side, and he realized that the fuel tanks had not been topped off as requested. He reduced engine power to conserve fuel and to increase the airplane's flight endurance while he continued to his destination. When the fuel gauges showed about 400-500 lbs of fuel per side, the low fuel lights for both wing fuel tanks illuminated. The pilot reported to air traffic control that the airplane was low on fuel and diverted the flight to the nearest airport. The pilot reported that the airplane was high and fast on the visual approach for landing. He misjudged the height above the ground and later stated that the airplane "landed very hard." The airplane's left main landing gear and nose gear collapsed and the airplane veered off the runway, resulting in substantial damage to the left wing. The pilot reported no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to fly a stabilized approach and his inadequate landing flare, which resulted in a hard landing. Contributing to the accident was the pilot's failure to ensure that the airplane was properly serviced with fuel before departing on the flight.

Events

1. Landing-flare/touchdown - Hard landing
2. Landing-flare/touchdown - Runway excursion

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Landing flare-Not attained/maintained - C
2. Personnel issues-Action/decision-Action-Incorrect action performance-Pilot - C
3. Aircraft-Fluids/misc hardware-Fluids-Fuel-Fluid level - F
4. Personnel issues-Task performance-Planning/preparation-Fuel planning-Pilot - F

Narrative

On December 4, 2016, about 1853 mountain standard time, a Cessna Citation 500, N332SE, sustained substantial damage during a hard landing and runway excursion at the Gunnison-Crested Butte Airport (GUC), Gunnison, Colorado. The pilot, the sole occupant, was not injured. The airplane was registered to and operated by the pilot under the provisions of the 14 Code of Federal Regulations Part 91 as a business flight. Night visual meteorological conditions prevailed at the time of the accident, and the flight was on an instrument flight plan. The flight departed the San Jose International Airport (SJC), San Jose, California, about 1616 and Pueblo, Colorado, was the destination.

The pilot reported that he originally requested that the fixed base operator (FBO) at SJC put 100 gallons of jet fuel in each wing fuel tank. Later during his preflight, the pilot decided that more fuel was needed, so he went back into the FBO and requested that the airplane's fuel tanks be topped off with fuel. The pilot was still in the FBO when he saw the lineman fuel the airplane from the fuel truck. He paid for the fuel without looking at the receipt and then proceeded out to the airplane. The pilot reported that he did not recheck the fuel gauges before departing SJC.

The pilot reported that he departed on the flight, but it was not until about an hour after takeoff that he checked the fuel gauges. He stated that the fuel gauges were showing about 900 to 1,000 lbs of fuel per side, and he realized that the fuel tanks had not been topped off with fuel. He reduced the throttles to conserve fuel and to increase the airplane's flight endurance while he continued the flight to Pueblo, Colorado.

The pilot reported that when the fuel gauges showed about 400 to 500 lbs of fuel per side, the low fuel lights for both wing fuel tanks illuminated. About 1840, the pilot reported to air traffic control (ATC) that the airplane was low on fuel and asked to land at the nearest airport. ATC provided radar vectors to GUC and initially cleared the flight for the ILS runway 6 approach. During the approach, the pilot reported that he had the runway in sight and ATC cleared the flight for a visual approach.

National Transportation Safety Board - Aircraft Accident/Incident Database

The pilot reported that the airplane was high and fast on the approach. At 500 ft above ground level, the airspeed was about 120 knots. He misjudged the runway and the height above the ground and he stated, "I landed very hard on runway 24." During touchdown, the airplane bounced and then impacted the runway. The airplane's left main landing gear and nose gear collapsed and the airplane veered off the runway, resulting in substantial damage to the left wing. The pilot reported no preaccident mechanical malfunctions or failures with the airplane that would have precluded normal operation.

At 1856, the surface weather observation at GUC was: wind 340 degrees at 4 knots; visibility 10 miles; sky condition few clouds at 7,500 ft; temperature -8 degrees C; dew point -13 degrees C; altimeter 30.08 inches of mercury.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# GAA17CA344 05/25/2017 1700 MST Regis# N153GC Peach Springs, AZ Apt: Grand Canyon West 1G4
Acft Mk/Mdl EUROCOPTER EC 130 B4-B Acft SN 7074 Acft Dmg: SUBSTANTIAL Rpt Status: Prelim Prob Caus: Pending
Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091
Opr Name: PAPILLON AIRWAYS INC. Opr dba: PAPILLON GRAND CANYON Aircraft Fire: NONE
HELICOPTERS

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# WPR16LA032	11/24/2015 945 PST	Regis# N50713	Carlisle, WA	Apt: N/a
Acft Mk/Mdl HUGHES 369D-D		Acft SN 710982D	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl ROLLS ROYCE 250-C20B		Acft TT 17942	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: OLYMPIC AIR INC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

Summary

The commercial pilot reported that, while relocating the helicopter to a staging area to refuel, the engine experienced a total loss of power. He initiated an autorotation to a partially-wooded area, where the helicopter touched down and rolled onto its right side. The pilot stated that, before the loss of engine power, he noticed that the fuel quantity indication was not decreasing as he would have expected. Postaccident examination revealed that the fuel quantity gauge indicated more fuel in the fuel tank than the amount that was physically present. This erroneous fuel level indication led the pilot to believe that more fuel was available than what was in the fuel tanks, and subsequently resulted in a total loss of engine power due to fuel exhaustion.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A total loss of engine power during cruise flight due to fuel exhaustion. Contributing to the accident was the improper calibration of the fuel quantity gauge.

Events

1. Enroute-cruise - Loss of engine power (total)
2. Autorotation - Collision with terr/obj (non-CFIT)
3. Landing - Roll over

Findings - Cause/Factor

1. Aircraft-Fluids/misc hardware-Fluids-Fuel-Fluid management - C
2. Aircraft-Aircraft systems-Fuel system-Fuel quantity indicator-Malfunction - F
3. Aircraft-Aircraft systems-Fuel system-Fuel quantity sensor-Malfunction - F

Narrative

On November 24, 2015, about 0945 Pacific standard time a Hughes 369D, N50713, sustained substantial damage during a forced landing following a loss of engine power near Carlisle, Washington. The helicopter was registered to and operated by Olympic Air, Shelton, Washington, under the provisions of Title 14 Code of Federal Regulations Part 91. The commercial pilot, sole occupant of the helicopter, was not injured. Visual meteorological conditions prevailed and no flight plan was filed for the repositioning flight. The flight originated from Hoquiam, Washington, about 5 minutes prior to the accident, with an intended destination of a staging area near Carlisle.

The pilot reported that he originally departed a staging area near Francis, Washington, where he was parked on a hillside, waiting for improving weather. Prior to departing, he added about 50 pounds of fuel, noting he had 250 pounds of fuel total on board. The pilot departed and decided to land at Hoquiam, after noticing that the fuel gauge quantity indication was not decreasing as he would have expected for the flight. The pilot landed uneventfully at Hoquiam, noted he had about 140 pounds of fuel on board according to the fuel gauge, which was consistent with his estimations of how much fuel should have been on board. The pilot decided to depart and relocate the helicopter 12 nautical miles to a staging area where he was planning to refuel the helicopter prior to conducting external load operations in the area. The pilot stated that during the flight, the engine lost total power. He initiated an auto rotation to a partially open wooded area. Subsequently, the helicopter landed and rolled onto its right side.

Postaccident examination of the helicopter by the pilot revealed that the tailrotor and tailrotor gearbox were separated from the tail boom. The helicopter was recovered to a secure location for further examination.

Examination of the recovered wreckage revealed that the main rotor blades were removed to facilitate wreckage transport. The tailboom had contact damage from main rotor blade strike(s) and was fractured into multiple segments. The tail rotor system was still attached to the tailboom's aft frame. The tail rotor blades were damaged but exhibited little rotational damage. All main rotor blades exhibited various areas of bends, leading edge and trailing edge damage.

Control continuity was established for the collective and cyclic controls. Except for breaks in the area of the tailboom damage, tail rotor control continuity was verified. The drive system was functional from the engine through the main transmission to the main rotor hub. The tail rotor driveshaft had multiple fractures aft of FS 150 due to impact damage. The tail rotor transmission and tail rotor controls functioned normally. The upper flight controls and main rotor hub sustained minimal damage.

National Transportation Safety Board - Aircraft Accident/Incident Database

Electrical power was applied to the airframe and the N2 warning horn was found functional. The caution light panel was tested and all normal lights illuminated, including the low level fuel light. At this time, the fuel gauge indicated zero pounds of fuel. The fuel cell access covers were removed and the cells inspected. Only a small amount of fuel was found in the sump area below the start pump.

The engine and related systems sustained little visible damage. A fuel system vacuum check was successfully completed. The airframe fuel filter was removed from the housing. The filter and housing exhibited a slight amount of foam-like debris. Similar debris was observed in the fuel boost pump and in both the left and right fuel tanks.

In order to examine the fuel gauge quantity accuracy, 20 gallons of fuel was added in intervals utilizing 5-gallon fuel cans. With electrical power applied to the helicopter, the fuel quantity indicated on the fuel gauge were measured. When 4, 5, 7.5, 10, 12.5, 15, and 20 gallons of Jet A, which weighs about 6.8 pounds per gallon, was added to tank, the fuel quantity gauge indicated about 40-45, 80, 100, 150, 155-160, 175, and 245 pounds of fuel respectively.

While removing the fuel which was previously added, the low level fuel light illuminated at which time the fuel gauge displayed about 70 pounds of fuel. After the low level fuel light illuminated, the remaining fuel within the tank was removed and measured at about 5 gallons.

National Transportation Safety Board - Aircraft Accident/Incident Database

Incident Rpt# WPR15IA244	08/17/2015 830 MST	Regis# N771RT	Page, AZ	Apt: N/a
Acft Mk/Mdl QUEST KODIAC 100-NO SERIES		Acft SN 100-0059	Acft Dmg: MINOR	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl PRATT AND WHITNEY PT6A-34		Acft TT 953	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 135
Opr Name: ARROW WEST AVIATION		Opr dba: REDTAIL AVIATION		Aircraft Fire: NONE
				AW Cert: STN

Summary

During the takeoff roll on the non-scheduled passenger flight, the pilot's seat slid back abruptly to the full-aft position. Because his right hand was positioned on the throttle for takeoff, the pilot inadvertently retarded the throttle to the idle position as the seat slid aft. The airplane began to veer off the runway and collided with a wire fence.

The seat was designed with two latches, one located on each of the right and left sides of the seat, which are lifted to enable the seat to move along the track. The seat track consisted of two metal rails that were affixed to the floor along the airplane's longitudinal axis. The rails had numerous circular receptacles where the seat stop would engage when the seat was locked into position. In order to move the seat, a handle on the latches would be raised upward, the seat stops would both raise, and the pilot could move the seat. The latch gives no positive indication (feel) when effectively raised or lowered. The before takeoff checklist contained in the pilot's operating handbook included the item, "seat locked and secure."

An examination of the pilot's seat revealed that both the left and the right aft locking foot caps were damaged. The locking foot caps comprise a four-pronged housing that engages the seat stop mechanisms. It is likely that the caps were damaged during maintenance and/or installation. Instead of completely removing the seat from the airplane, the technician likely pushed the seat all the way aft on the tracks. Investigators attempted to replicate the incident scenario and were successful only when applying an extreme side load or manipulating the latch. The lack of positive response in the latch of the stops being engaged in the tracks made it difficult to verify if the seat stops were positively engaged before the takeoff attempt. It is unknown if the damaged locking foot caps contributed to the incident.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's inadvertent failure to engage the seat in the locked position before takeoff, which resulted in the seat sliding back during the takeoff roll and a subsequent loss of directional control. Contributing to the incident was the seat locking mechanism's design of limited feedback, which made it difficult to verify if the seat stops were positively engaged.

Events

1. Takeoff - Sys/Comp malff/fail (non-power)

Findings - Cause/Factor

1. Personnel issues-Action/decision-Action-Incomplete action-Pilot - C
2. Aircraft-Aircraft structures-Fuselage-Seat/cargo attach fitting-Incorrect use/operation - C

Narrative

HISTORY OF FLIGHT

On August 17, 2015, about 0830 mountain standard time, a Quest Kodiak 100, N771RT, sustained minor damage when the pilot's seat slid aft and the airplane veered from the landing strip during the takeoff roll near Page, Arizona. The commercial pilot and five passengers were not injured. Redtail Partners, LLC owned the airplane and Arrow West Aviation (dba Redtail Aviation) was operating it under the provisions of Title 14 Code of Federal Regulations Part 135. Visual meteorological conditions prevailed and a company flight plan had been filed for the non-scheduled cross country flight. The flight was originating at the time of the accident with a planned destination of Canyonlands Field Airport, Moab, Utah.

The pilot stated that the purpose of the flight was to transport the passengers back to Moab, which required him to depart from a remote paved road that was regularly used as a runway. The airplane began the takeoff roll, and after about 100 feet down the road, the pilot's seat slid back abruptly to the full aft position. Because his right hand was positioned on the power lever for takeoff, the pilot inadvertently retarded the lever to the idle position as the seat slid aft. The pilot released his grip on the control yoke in an effort to keep the nose down. His feet were unable to reach the rudder pedals and with the seatbelt in the locked position, he was not able to manipulate his body forward to regain control.

The pilot further stated that the airplane began to veer to the left, continued off the pavement, and collided into a wire fence. After the airplane came to rest, the pilot was able to move the seat forward where he could reach the shoulder harness unlock-lever. The pilot and passengers egressed the airplane without

incident.

AIRPLANE INFORMATION

The Quest Kodiak 100 is a high-wing, unpressurized, single-engine turboprop-equipped fixed tricycle landing gear airplane manufactured by Quest Aircraft. The airplane was configured with 10-seats, two of which were adjustable seats in the pilot (left) and co-pilot (right) position. According to the records examined, the airplane, serial number 100-0059, was manufactured in November 2011, and was purchased by the operator in 2012. At the time of the accident, the airframe had accumulated a total time in service of 953.4 hours. The operator reported that the most recent annual inspection was completed on May 23, 2015, at which time it had accumulated 864 total hours in service.

Standard seating for the airplane consists of six-way adjustable pilot and front passenger seat each equipped with a four-point passenger restraint system. They may be moved forward or aft, adjusted up or down and the seat back angle may be changed.

The incident seat was part number 100-825-5010-01 and manufactured by Millennium Concepts, Inc. The seat was designed with two latches located on both the right and left side that are lifted to enable the seat to move along the track. The seat track consisted of two metal rails that were affixed to the floor along the longitudinal axis. The rails had two scalloped edges facing toward one another at one-inch spacing, creating numerous circular receptacles where the seat stop would engage when the seat was locked into position. The foot weldments would slide in the rails' channel under the scalloped upper layer.

The latches were comprised of a plastic rocker-type handle that rotated about a plastic pin when raised upward. When lifted, two swages from the latch-end of the seat stop actuator cable would be pulled and in response the swaged end from the seat-track end would raise the seat stop (a pin-like metal cylinder that engages in the seat track receptacles). Each latch contained a swaged-end from both a left and a right side seat-stop actuator cable enabling both the left and the right seat stops to raise at the same time.

The seat stop contains a groove where the actuator cable swages (one from the right and one from the left latch) are captured. The locking foot cap, a four pronged housing, engages the seat stop and the locking foot spring is located between it and the seat stop pin. With a latch raised, one of the swages captured in the seat stop pin (depending on if it was the right or left side latch) would override the force of the spring that normally holds the seat stop pin down against the lip of the foot weldment. This in turn would raise the seat stop pin leaving room between it and the bottom of the weldment lip (where the scalloped edges of the seat track rail can slide between). The latch gives no positive indication (feel) when effectively raised or lowered.

The airplane's Pilot Operating Handbook contains a checklist in the "Before Takeoff" section that lists "seat locked and secure."

TESTS AND RESEARCH

The seat was removed and examined by investigators from the NTSB and Quest Aircraft. The complete examination notes with pictures are in the public docket for this accident.

An external examination of the pilot's seat revealed that both the left and the right locking foot caps were damaged. Specifically, they were bent and the locking foot spring was displaced from the ridge it rests on. The forward tabs were bent forward resting outside of their respective foot weldments, the steel piece that slides on the bottom of the track that is positioned in between the stop halves. The aft tabs were bent forward and crushed about the aft foot weldment groove.

Investigators removed the copilot seat and installed it on the pilot seat tracks. On the first attempts, the seat operation appeared normal and throughout the course of all the testing conducted, it was not possible for investigators to disengage the seat from the engaged position unless a latch was raised.

Over numerous tests sliding the seat back on the rail with the locking pin initially disengaged, investigators were able to get the seat to move freely (not automatically lock the locking pin) only when applying an extreme side load or pulling one swage taught on the latch. Since the two feet are on independent systems, it was not understood how that could have occurred. The lack of positive response of the finger actuated latch made it difficult to verify if the seat was actually engaged.

Investigators were able to replicate the position the seat would need to be manipulated to bend the locking foot cap. This could occur if the front legs weldments were out of the seat track and the seat was tilted backward. This likely would take place during maintenance and/or installation if the aft feet were

not disengaged from the seat track and the technician wanted to push the seat all the way aft to the passengers' seats. The manufacturer provided detailed procedures illustrating the proper way to remove and install the crew seats. It is unknown if the damaged locking foot caps contributed to the incident.

ADDITIONAL INFORMATION

Following the examination, Quest queried their operators to see if any similar incidents had happened. A pilot reported that during takeoff, with the airplane configured in a steep nose-up attitude, his seat slid back and he asked the co-pilot to take the controls. The pilot stated he never adjusted the seat to see if the seat latch was engaged, rather entered into the cockpit and flew.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# GAA17CA235	04/14/2017 2200	Regis# N481HC	Richfield, UT	Apt: Richfield Muni RIF
Acft Mk/Mdl RAYTHEON AIRCRAFT COMPANY		Acft SN BB-1908	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl PRATT & WHITNEY PT6-42		Acft TT 3631	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: IHC HEALTH SERVICES INC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STT

Summary

The pilot reported that, during taxi on a parking ramp at night, he decided to make a 180ø left turn to position the airplane before picking up a patient. He added that, during the turn, the right wing impacted a fence post.

The right wing sustained substantial damage.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain separation from a fence post during taxi at night.

Events

1. Taxi-from runway - Miscellaneous/other

Findings - Cause/Factor

1. Personnel issues-Psychological-Attention/monitoring-Monitoring environment-Pilot - C
2. Environmental issues-Physical environment-Object/animal/substance-Fence/fence post-Effect on operation
3. Environmental issues-Conditions/weather/phenomena-Light condition-Dark-Effect on personnel

Narrative

The pilot reported that during taxi on a parking ramp at night he decided to make a 180ø left turn to position the airplane before picking up a patient. He added that during the turn, the right wing impacted a fence post.

The right wing sustained substantial damage.

The pilot reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# WPR16LA075 02/23/2016 1145 PST Regis# N266RH Torrance, CA Apt: Zamperini Field TOA
Acraft Mk/Mdl ROBINSON HELICOPTER CO R66-NO Acft SN 0002 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl ROLLS-ROYCE 250-C300/A1 Acft TT 400 Fatal 0 Ser Inj 0 Flt Conducted Under: FAR 091
Opr Name: ROBINSON HELICOPTER CO Opr dba: Aircraft Fire: NONE

Summary

The commercial pilot was performing company flight testing in the helicopter. After performing an air taxi and a hovering autorotation, the pilot conducted a simulated maximum performance takeoff. About 200 ft above ground level, the pilot heard a noise and felt a momentary helicopter vibration. He subsequently performed a precautionary autorotation to a grass area on airport property. The pilot stated that the helicopter had forward speed during the landing and that the grass was soft; as a result, the helicopter entered a fore-aft rocking motion after touchdown, and the main rotor contacted the tail boom, resulting in substantial damage.

Postaccident review of data from the engine monitoring unit revealed no anomalies, and an examination of the helicopter revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation; therefore, the reason for the noise and vibration could not be determined.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A vibration of the helicopter, which resulted in an autorotation to soft terrain and subsequent impact of the tail boom with the main rotor. The reason for the vibration could not be determined because postaccident examination revealed no malfunctions or anomalies that would have precluded normal operation.

Events

1. Maneuvering - Miscellaneous/other
2. Autorotation - Miscellaneous/other
3. Landing-flare/touchdown - Abrupt maneuver

Findings - Cause/Factor

1. Not determined-Not determined-(general)-(general)-Unknown/Not determined - F
2. Environmental issues-Physical environment-Terrain-Wet/muddy terrain-Not specified

Narrative

HISTORY OF FLIGHT

On February 23, 2016, about 1145 Pacific standard time, a Robinson R66, N266RH, sustained substantial damage to the tailboom following a precautionary autorotation at Zamperini Field Airport (TOA), Torrance, California. The pilot, the sole occupant, was not injured. The experimental (research and development category) test helicopter was registered to and operated by Robinson Helicopter Company (RHC) as a test flight under the provision of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight that originated from TOA at 1145.

The purpose of the flight was to test the auxiliary fuel system, low RPM horn, autopilot, and sprag clutch.

The pilot reported that he had performed a takeoff to a hover, a hover taxi, and one hovering autorotation without incident. He then executed a maximum performance takeoff. About 200 feet above ground level, the pilot heard a noise and felt a momentary helicopter vibration. Subsequently, he performed an autorotation to a grassy area on the airfield. After the helicopter landed in soft grass with forward momentum, it experienced a fore and aft rocking motion, and the main rotor blades contacted the tailboom.

HELICOPTER INFORMATION

The five-seat helicopter, serial number 0002, was manufactured in 2009. The operator reported that the helicopter's maximum gross weight was 2,700 pounds, and it weighed 2,047 at the time of the accident. The helicopter was powered by a 300-horsepower Rolls Royce 250-C300/A1 engine. The last annual maintenance inspection was conducted on October 15, 2015, at the total engine time of 363 hours. The airframe had a total of 400.04 hours at the time of the accident, as it had operated 20 hours since its last maintenance inspection. The engine was examined on March 4, 2016, at RHC, Torrance, California.

TESTS AND RESEARCH

A visual examination of the airframe components was conducted and no anomalies were found. There were no metal particles found in the oil filter and the chip detector. The Engine Monitoring Unit (EMU) data was downloaded and reviewed by a representative from Rolls-Royce. The EMU provided general information about the operation of the engine including time, cycles, faults and any exceedances of engine operating limits. The downloaded data corresponded to the entire accident flight. There were no exceedances noted in the data; however, at the time stamp 32.27.1 the power turbine (N2) peaked at 107.76% and the Torquemeter Oil Pressure (TMOP) peaked at 95.304% (275 ft/lbs). According to the Rolls Royce 300 Operational and Maintenance Manual, the limit for N2 is 110% for 15 seconds, and the torque limit during takeoff is 288 ft/lbs with a maximum transient of 430 ft/lbs.

With no pre-accident anomalies noted with the engine, the engine was test run on the helicopter through various power settings. No anomalies were noted during the engine exam. The engine data was downloaded after the engine runs, and no faults were noted in the data.

Following the engine run, the sprag clutch was inspected and it was revealed that the sprag clutch had moved between 45-90 degrees from its original position. The sprag clutch was then removed, and it was observed that it took about 550 pounds of torque to loosen the clutch assembly compared to the 300 pounds of torque used to tighten the clutch in the assembly process. The clutch was then inspected, and no anomalies were found.

A review of the maintenance logbook revealed that the new Revision E sprag clutch had been installed on the helicopter before the accident flight. The Revision E sprag clutch was compared to the previously installed Revision D sprag clutch, and the wear patterns appeared normal and consistent with those observed in the Revision E clutch assembly.

The complete engine report is appended to this accident in the public docket.

The Pilot's Operating Handbook states that a vibration can be an indication of a drive system failure. However, a drive system failure is also accompanied by nose right or left yaw, and a decrease of the rotor RPM while N2 RPM increases.

RHC Safety Notice SN-39, issued in July 2003, stated that an unusual vibration can indicate a main rotor blade crack. However, those vibrations are characterized as severe and the helicopter would be difficult to control.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# GAA16CA527	06/20/2016 1758 EDT	Regis# N127WD	Farmingdale, NY	Apt: Republic FRG
Acft Mk/Mdl SWEARINGEN SA226-T(B)		Acft SN T-297	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl GARRETT TPE33110U501G		Acft TT 4500	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: PONDEROSA AIR LLC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

Summary

According to the pilot in command (PIC), he was conducting an instructional flight for his "new SIC (second in command)," who was seated in the left seat. He reported that they had flown two previous legs in the retractable landing gear-equipped airplane. He recalled that, during the approach, they discussed the events of their previous flights and had complied with the airport control tower's request to "keep our speed up." During the approach, he called for full flaps and retarded the throttle to flight idle. The PIC asserted that there was no indication that the landing gear was not extended because he did not hear a landing gear warning horn; however, he was wearing a noise-cancelling headset. He added that the landing gear position lights were not visible because the SIC's knee obstructed his view of the lights. He recalled that, following the flare, he heard the propellers hit the runway and that he made the decision not to go around because of unknown damage sustained to the propellers. The airplane touched down and slid to a stop on the runway. The airplane sustained substantial damage to the fuselage bulkheads, longerons, and stringers.

The SIC reported that the flight was a training flight in visual flight rules conditions. He noted that the airspace was busy and that, during the approach, he applied full flaps, but they failed to extend the landing gear. He added that he did not hear the landing gear warning horn; however, he was wearing a noise-cancelling headset.

The Federal Aviation Administration Aviation Safety Inspector that examined the wreckage reported that, during recovery, the pilot extended the nose landing gear via the normal extension process. However, due to significant damage to the main landing gear (MLG) doors, the MLG was unable to be extended hydraulically or manually. He added that an operational check of the landing gear warning horn was not accomplished because the wreckage was unsafe to enter after it was removed from the runway.

The landing gear warning horn was presented by an aural tone in the cockpit and was not configured to be heard through the pilots' noise-cancelling headsets. When asked, the PIC and the SIC both stated that they could not remember who read the airplane flight manual Before Landing checklist.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot-in-command's failure to extend the landing gear before landing and his failure to use the Before Landing checklist. Contributing to the accident was the pilots' failure to maintain a sterile cockpit during landing.

Events

1. Landing-flare/touchdown - Abnormal runway contact
2. Landing-landing roll - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Aircraft systems-Landing gear system-Gear extension and retract sys-Not used/operated - C
2. Personnel issues-Task performance-Use of equip/info-Use of checklist-Pilot - C
3. Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - C
4. Personnel issues-Action/decision-Action-Lack of action-Pilot - C
5. Personnel issues-Task performance-Communication (personnel)-(general)-Flight crew - F
6. Personnel issues-Psychological-Attention/monitoring-Task monitoring/vigilance-Flight crew

Narrative

According to the pilot in command (PIC), he was conducting an instructional flight for his "new SIC (second in command)," and seated in the left seat. He reported that they had flown two previous legs in the retractable landing gear-equipped airplane. During the approach, he recalled that they discussed the events of their previous flights and had complied with the airport control tower's request to "keep our speed up". During the approach, he called for full flaps and retarded the throttle to flight idle. The PIC asserted that there was no indication that the landing gear was not extended, as he did not hear a landing gear warning horn; however, he was wearing a noise cancelling headset. He added that the landing gear position lights were not visible because the knee of SIC obstructed his view of the lights. He recalled that following the flare he heard the airplane propellers hit the runway, and he made the decision not to go-around because of the unknown damage sustained to the propellers. The airplane touched down, and slid to a stop on the runway. The airplane sustained substantial damage to the fuselage bulkheads, longerons and stringers.

National Transportation Safety Board - Aircraft Accident/Incident Database

The SIC reported that the flight was a training flight in VFR conditions. He noted that the airspace was busy, and during the approach he applied full flaps, but they failed to extend the landing gear. He added that he did not hear the landing gear warning horn; however, he was wearing a noise cancelling headset.

The Federal Aviation Administration, Aviation Safety Inspector that examined the wreckage reported that during recovery the pilot extended the nose landing gear via the normal extension process. However, due to significant damage to the main gear doors, the main landing gear was unable to be extended hydraulically or manually. He added that an operational check of the landing gear warning horn, was not accomplished because the wreckage was unsafe to enter after it was removed from the runway.

Both pilots were wearing noise canceling headsets, and the landing gear warning horn is presented by an aural tone in the cockpit, and is not configured to be heard through the crew's headsets.

When asked, the PIC and the SIC both stated that they could not remember who read the airplane flight manual (AFM) before landing checklist.