
National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# GAA17CA360	06/22/2017 1700	Regis# N700LA	Portales, NM	Apt: N/a
Acft Mk/Mdl AIR TRACTOR INC AT 502-B		Acft SN 502B-0700	Acft Dmg: DESTROYED	Rpt Status: Prelim Prob Caus: Pending
			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 137
Opr Name: KING AG AVIATION INC.		Opr dba:		Aircraft Fire: GRD

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Accident Rpt# DCA17CA111	05/02/2017 1930 EDT	Regis# N595JB	Boston, MA		
Acft Mk/Mdl AIRBUS A320 232-232		Acft SN 2286	Acft Dmg: NONE	Rpt Status: Prelim	Prob Caus: Pending
		Acft TT 50634	Fatal 0	Ser Inj 1	Flt Conducted Under: FAR 121
Opr Name: JETBLUE AIRWAYS		Opr dba:		Aircraft Fire: NONE	

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Accident Rpt# ERA16FA248 07/11/2016 1123 CDT Regis# N427TV Hickory, KY Apt: Gravel Lot NONE
Acft Mk/Mdl BELL HELICOPTER TEXTRON CANADA Acft SN 54106 Acft Dmg: SUBSTANTIAL Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl ROLLS-ROYC 250-C47B Acft TT 1390 Fatal 1 Ser Inj 0 Flt Conducted Under: FAR 091
Opr Name: TENNESSEE VALLEY AUTHORITY Opr dba: Aircraft Fire: NONE
AW Cert: STN

Events

1. Approach-VFR pattern final - Flight control sys malff/fail
2. Approach-VFR pattern final - Flight control sys malff/fail

Narrative

HISTORY OF FLIGHT

On July 11, 2016, at 1123 central daylight time, a Bell 407, N427TV, collided with terrain during the approach to landing at the Tennessee Valley Authority (TVA) Mayfield Customer Service Center, Hickory, Kentucky. The commercial pilot was fatally injured, and the helicopter was substantially damaged by impact forces. The helicopter was registered to and operated by the TVA under the provisions of 14 Code of Federal Regulations Part 91 as a business flight. Day visual meteorological conditions prevailed, and no flight plan was filed. The flight originated from Outlaw Field Airport (CKV), Clarksville, Tennessee at 1048.

According to TVA personnel, the pilot flew the helicopter from Knoxville, Tennessee, to CKV, refueled, and then flew to the TVA Customer Service Center to pick up a maintenance lineman for the purpose of inspecting power lines and equipment.

According to a TVA lineman who witnessed the accident, there was a light wind from the south/southeast, and the helicopter appeared to be making its final approach from the north. The witness stated that there were no abnormalities in the helicopter's sound or position, until the helicopter was about 75 to 100 ft above the ground. He then observed the main rotor abruptly tilt to the right. Immediately after, the helicopter banked right, fell to the ground, and came to rest on its right side. The witness stated that he never lost sight of the helicopter and described the impact as very hard with no sliding or bouncing. He saw the rotor blades break apart. The witness then ran into the building to get help. The helicopter's engine continued to run after the accident and was subsequently shut down by responding personnel.

Initial examination of the wreckage revealed that the collective lever, which connected the cockpit collective controls to the main rotor, was disconnected from the pivot sleeve. The attaching hardware for the lever was subsequently found loose in the wreckage near the main rotor hub.

PERSONNEL INFORMATION

The pilot, who was seated in the right cockpit seat, held a Federal Aviation Administration (FAA) commercial pilot certificate with airplane single-engine land, rotorcraft-helicopter, instrument airplane, and instrument helicopter ratings. He held an FAA second-class medical certificate with a restriction to wear corrective lenses.

The pilot reported 18,430 total hours of flying experience on his latest medical certificate application, which was dated March 31, 2016. TVA personnel reported that his flight experience in the Bell 407 was about 850 hours. He completed a flight review in a MD Helicopters MD530 helicopter on February 12, 2016, and a flight review in the Bell 407 on January 5, 2016.

AIRCRAFT INFORMATION

The helicopter was a Bell Helicopter model 407, serial number 54106, built in 2012 and purchased new by the TVA. It was a single-engine helicopter of conventional construction and equipped with a four-blade, soft-in-plane design, composite hub, main rotor system, a full monocoque aluminum-skinned tail boom, and a conventional two-blade tail rotor system.

The helicopter was powered by a Rolls-Royce model 250-C47B turboshaft engine, serial number CAE-848434, with maximum takeoff and maximum continuous power ratings of 650 and 600 shaft horsepower, respectively.

The helicopter was issued a normal category standard airworthiness certificate and was maintained under an approved aircraft inspection program. Between

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May 31, 2016, and June 20, 2016, the helicopter was at the TVA maintenance facility at Muscle Shoals, Alabama, and the following inspections were accomplished: annual/50hr/100 hr, 150hr, 300 hr, 300hr/12 month, 600hr/12 month, 1200 hr/2 year, 12-month and 24-month inspections. From June 20, 2016, until the time of the accident, the helicopter was operated about 38.4 hours.

The collective lever was located at the front and bottom of the swashplate support. The collective lever and collective control link were designed to move the pivot sleeve vertically on the swashplate support to change the pitch on all the main rotor blades simultaneously. The collective lever was attached to the pivot sleeve with screws, washers, and pivot pins (see figure 1). Once attached, the and the specified torque was applied, locking wire would typically be affixed to the screw.

Figure 1 - Swashplate support assembly, with collective pitch lever attaching hardware outlined in red.

The maintenance tasks performed during the inspections between May 31, 2016, and June 20, 2016, did not require the removal of the collective lever or the disconnection or inspection of the collective lever pins or screws. Although an inspection of the condition of the flight control bolts and nuts was one of the maintenance tasks performed, an inspection of the collective lever pins, screws, and corresponding lockwire was not included in that inspection.

The maintenance and inspections of the helicopter's flight controls, including the collective control, were performed by two TVA airframe and powerplant mechanics and one TVA foreman, who assisted in the work and supervised the operation. All three employees were interviewed by FAA inspectors following the accident.

One of the mechanics re-installed an anti-drive lever assembly. He did not recall removing the lockwire on the collective lever pin screws or removing the pins. He stated that the other mechanic performed the 24-month inspection of the flight control bolts and nuts. He further stated that the collective lever pins were not part of that inspection.

The other mechanic performed the 24-month inspection of the flight control bolts and nuts. When asked if he removed the collective lever pins, he responded, "No, I don't remember doing it. If anyone would have done it, it would have been me, but I don't remember doing it."

The foreman inspected the work performed in the area of the flight controls. He reported that the removal of the collective lever pins "was not part of the required maintenance performed." He was not aware that the pins were removed or that any lockwire was removed. He added further, "I could see why it could have been done. The 24-month flight control bolt inspection was being performed, why not pull them and look at them too. I've done it before."

Both mechanics reported that they would occasionally be "pulled off" an aircraft to perform work on another project. One mechanic stated that there was a lack of documentation of what parts were removed, such as a continuation sheet.

METEOROLOGICAL INFORMATION

Mayfield - Graves County Airport (M25), Mayfield, Kentucky, was the closest official weather station, which was 8 miles from the accident location. The M25 weather at 1135 included wind from 120° at 5 knots, visibility 10 statute miles, scattered clouds at 1,000 and 2,200 ft, overcast ceiling at 10,000 ft, temperature 26°C, dew point 22°C, and altimeter setting 30.06 inches of Mercury.

WRECKAGE AND IMPACT INFORMATION

General

The helicopter came to rest on its right side, about 220 ft west of the intended landing zone (LZ). The LZ was a level, open, gravel-covered storage area for power transmission equipment. All four main rotor blades separated from the main rotor hub during the impact sequence. The aft section of the tail boom severed from the fuselage, and the tail rotor assembly remained attached to the aft section of the tail boom.

Fuel and Hydraulic Systems

The helicopter's fuel system was not compromised and contained about 695 pounds of fuel. No fuel leaks were observed, and all fuel hoses and lines were secure. The airframe-mounted fuel filter was clean, and the fuel inside was clear with no particulates noted. Hydraulic fluid was observed in the hydraulic system reservoir. All lines and hoses were secure, and there were no leaks noted.

Landing Gear

The right skid of the landing gear was fractured fore and aft, above the saddle. The right step was separated due to fractured brackets. There was an impact mark on the aft portion of the right skid that matched the general size and shape of a ground scar at the point of initial ground impact. The front cross tube remained attached to the fuselage by one bracket, and the rear cross tube was not attached to the fuselage due to fractures at the support brackets.

Fuselage

The forward fuselage exhibited crushing damage on its right side along the bottom of the fuselage. The center post of the windscreen was fractured at the bottom. The battery cover on the nose was damaged near the hinged area near the bottom of the center post. The transmission deck exhibited minor damage to its right side.

Main and Tail Rotor Systems

Examination of the main rotor blades revealed that all four rotor blades were fractured. The yoke exhibited fracturing near all four inner elastomeric shear bearings with "strawing" signatures on the flexures. The blue pitch link was bent outward towards the top with all pitch link hardware present and all cotter keys installed. The red and orange pitch change links were undamaged with pitch link hardware present and all cotter keys installed. The green pitch change link was bent and fractured from impact forces and was found near the main wreckage. Each blade exhibited bending and delamination. All blades exhibited ground impact marks on the leading edges.

Main rotor continuity was confirmed by rotating the drive shaft by hand. Movement was confirmed from the drive shaft through the transmission to the mast. The transmission was visually inspected and no pre-impact anomalies were observed. The chip detectors were removed and visually inspected with no ferrous particulate matter observed. No abnormal sounds were heard when the transmission was rotated by hand. The transmission was not disassembled.

The tail boom was fractured near the aft bulkhead, just aft of the intercostal support and the fracture surfaces were consistent with a counter-clockwise main rotor strike to the ground. The vertical fin displayed scraping damage on its lower, outboard side, and the anti-collision light remained intact. The tailskid remained attached. Both the left and right finlets on the horizontal stabilizer were fractured and missing from the stabilizer from impact forces.

Both tail rotor blades exhibited minor ground impact damage; however, no rotational scoring was observed on either blade. The tail rotor was easily rotated in both directions with no abnormal binding or noises. The pitch of the tail rotor blades was manipulated by hand with appropriate control movement noted forward to the aft end of the fractured control tube. The flapping stops exhibited compression signatures with corresponding impact marks on the yoke.

The forward end of the forward short shaft remained attached to the output end of the freewheel unit. The aft end of the forward short shaft remained attached to the forward end of the oil cooler blower shaft. The oil cooler blower shaft was rotated by hand with slight binding due to shifting of the forward end of the aft short shaft. The forward end of the aft short shaft remained coupled with the aft end of the oil cooler blower shaft. The aft end of the aft short shaft remained connected to the hanger bearing. Rotational scoring was observed on the aft short shaft with signatures indicative of contact with the engine oil tank bracket. The forward end of the #4 tail rotor drive shaft segment was separated. The #3 and #2 tail rotor drive shaft segments were separated from the tail boom and were found adjacent to the main wreckage. The forward end of the #1 tail rotor drive shaft segment was connected to the hanger bearing with the aft end of the #1 tail rotor drive shaft segment connected to the input shaft of the tail rotor gear box at the Thomas coupling. Oil was evident in the tail rotor gear box. No chips were observed on the gear box chip detector.

Flight Controls

The left collective control was not installed. Collective control continuity was confirmed through the right collective and up through the servo actuators to the

disconnected collective lever. The two collective lever pivot pins and screws that attached the collective lever to the pivot sleeve were not installed. The pivot pins and screws were found on the transmission deck and on the ground underneath the right side of the helicopter. The flat washers and lockwire were missing; the washers were later found during a subsequent examination of the wreckage.

The left cyclic control was not installed. Cyclic control continuity was confirmed through the right cyclic and up through the servo actuators to the inner, non-rotating swashplate.

The left anti-torque pedals were intentionally locked in place by the operator before the accident flight. The right anti-torque pedals were fractured at the outboard bell crank of the pedal control tube; however, directional control was confirmed when the tail rotor control tube, located near the tail rotor servo, was manipulated by hand. During manipulation, there was corresponding movement of the fractured pedal control tube and the fractured control tube aft of the tail rotor servo.

Engine

The engine remained in place, and all mounts were secure. No external engine damage was noted during the inspection. The hydromechanical unit linkage was intact, and its rigging appeared normal. The helicopter was equipped with an engine inlet barrier filter, which was normal in appearance and did not appear to be obstructed.

The engine-mounted fuel filter bowl from the combined engine filter assembly (CEFA) was full of clean, normal-appearing fuel. The CEFA fuel filter element was free of debris, and the pending bypass button was not extended. The fuel nozzle exhibited no anomalies, and some carbon formation was noted on the air shroud.

The engine-mounted scavenge oil filter on the CEFA was free of debris, and the pending bypass indicator button was not extended. The oil reservoir, which was mounted on the helicopter, was compromised, which precluded determination of the oil level. Both the upper and lower magnetic chip detectors were free of ferrous particulate matter. The engine gearbox oil was not drained.

No foreign object damage was noted on the compressor inlet guide vanes or on the impeller blade leading edges. The N1 rotor turned with some resistance and was mechanically coupled from the compressor to the starter generator. The N2 system turned when manipulated by hand and was continuous to the main rotor head. Due to deformation of the exhaust stack, the fourth-stage turbine wheel could not be inspected.

All of the external air, oil, electrical, and fuel lines were secure when checked by hand. None of the b-nut connectors were loose, and torque paint was present on the connections. No red indicators were visible on the electrical connectors.

The engine was controlled by a full authority digital electronic control (FADEC), which contained non-volatile memory in the electronic control unit (ECU). By design, when one of the predetermined parameter trip points is exceeded, the ECU begins recording incident data at a rate of one record per 1.2 seconds. The initial trigger for this event was low rotor speed (less than 92%).

The ECU was downloaded by a Rolls-Royce technical representative. A review of the data revealed no engine anomalies that would have precluded the engine from performing to specification before impact.

The ECU also retained engine maintenance history data in the maintenance terminal section. There were no pre-event faults or abnormalities noted in the maintenance terminal data. There were multiple faults recorded during the event, which corresponded to the impact sequence.

MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Chief Medical Examiner, Commonwealth of Kentucky, Louisville, Kentucky, performed an autopsy of the pilot. The cause of death was blunt impact injuries of the head, neck, and torso with traumatic/positional asphyxia, and the manner of death was accident.

The FAA's Bioaeronautical Research Sciences Laboratory performed toxicology testing on specimens from the pilot. The specimens tested negative for carbon monoxide, ethanol, and major drugs of abuse.

SURVIVAL ASPECTS

The helicopter's front seats were equipped with 4-point restraints. The outboard (right side) restraint attachment point for the pilot's lap belt was separated from the airframe wall. The rivets were pulled through and attached on one side, and the rivets were sheared on the other side. The sheared rivets were not located; however, the rivet holes were elongated from shear forces.

The pilot was not wearing a helmet at the time of the accident, nor were helmets required or provided for helicopter operations at the TVA.

TESTS AND RESEARCH

The collective lever and attachment hardware were sent to the NTSB Materials Laboratory for further examination. The collective lever, collective lever pins, collective lever pin screws, and washers were examined visually and by optical microscopy. All components were intact. Threads on the collective lever pin screws and the mating threaded holes in the collective lever were intact with no evidence of stripping. Holes for attaching lockwire were present in the heads of the screws and at an adjacent area on the collective lever, but no lockwire was observed attached at either location. Deformation at the edges of the lockwire holes was noted. Circumferential scoring was present across the entire face on one side of one of the washers. On one of the screws, thread peaks were flattened near the middle of the shank on one side of the screw consistent with contact with the collective lever pin hole bore with the screw partially threaded into place.

ADDITIONAL INFORMATION

Subsequent to the accident, the operator implemented numerous safety initiatives to prevent recurrence, including two independent safety audits, a formal fatigue risk management program, a safety management system, a formal tool/material accountability program, new work interruption policies, creation of a formally-trained safety officer position, and a formal process for the communication of safety-critical information.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# CEN16LA288	07/21/2016 1400 CDT	Regis# N7581F	Baldwin, WI	Apt: Baldwin Airport WI14
Acft Mk/Mdl CESSNA 208B-B		Acft SN 208B0389	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl HONEYWELL TPE331		Acft TT 10660	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: SKY DIVE TWIN CITIES		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

Events

1. Landing-landing roll - Runway excursion

Narrative

On July 21, 2016, about 1400 central standard time, a Cessna 208B air drop configured airplane, N7581F, registered to Desert Sand Aircraft Leasing Company, Inc., of Carson City, Nevada, sustained substantial damage during a runway excursion after landing on runway 18 at the Baldwin Airport (WI14), Baldwin, Wisconsin. The commercial pilot and 14 passengers were not injured. The air drop flight was being operated by Skydive Twin Cities, of Baldwin, Wisconsin, and conducted under the provisions of Federal Code of Regulations Part 91. No flight plan was filed and local traffic advisory was requested by the pilot. Visual meteorological conditions with light rain showers prevailed throughout the area. The flight originated from WI14 about 1350.

According to the pilot, he had ferried the airplane from Forest Lake, Wisconsin, to WI14 on the morning of the accident. The airplane had just completed its 100-hour inspection at Forest Lake. After flying three air drops without incident, he prepared for his fourth flight of the day. He stated that all the previous 3 flights had successfully deployed the parachutists and were full stop landings in an empty airplane. Due to the temperatures of 90+ degrees and high humidity, the pilot requested his manifests limit to 14 parachutists and allow a longer time between shutdowns to allow for adequate cooling before the next flight.

The pilot reported that pop-up rain showers had been passing north and south of Baldwin throughout the morning, but never coming closer than 10-15 miles. While preparing for the fourth flight of the day (accident flight) the pilot discussed the weather with an experienced parachutist. Clouds were currently over the intended drop zone but there was no rain and the clouds were moving away from the northern edge of the drop zone. The pilot and parachutist agreed that it was worth attempting the drop considering the cloud movement away from the drop zone. The 14 parachutists were loaded and the airplane took off. Climbing through 3,000 feet MSL, the pilot checked in with ATC for traffic advisory and a radio check. Climbing through 4,000 feet, ATC advised the pilot that light to moderate precipitation was in the area. The pilot continued to climb toward the drop zone to see if there was any rain over the area and about 1-1.5 miles from the zone, light rain was encountered. The pilot advised the parachutists that they were returning to Baldwin to land because of the weather.

After descending, the pilot set up a base leg to runway 18, and about two miles from the airport, turned on final. The approach was a stabilized, powered-on approach which was much flatter than the standard descent with an empty airplane. The pilot used flaps incrementally to 30-degrees (full flaps), initiated a flare over the threshold, and touched down at 65 knots. Full reverse propeller was used and the flaps retracted during the landing rollout. When the pilot started to apply brakes, he discovered that the braking action was null. The 1,950-foot-long grass runway was wet because of a recent rain shower. Because of the elevated temperature, humidity, full load, and trees at the end of the runway, the pilot decided to not attempt a go around. The pilot held full aft on the control yoke for aerodynamic braking, stayed in full propeller reverse, and braked as much as possible without locking the wheels up. Just before coming to a complete stop (about 5-10 mph), the airplane rolled into a ditch before a road beyond the departure end of the runway, resulting in substantial damage to the empennage. The pilot secured the engine and all the occupants exited the airplane.

According to Cessna, the applicable 208B Pilot Operating Handbook (POH) tables do not provide for landing on WET grass runways. However, for landing on DRY grass runways, 40% distance is added to the normal landing roll distance chart figures. On NTSB Form 6120, the pilot reported an aircraft weight 8,010 pounds at the time of the accident. The nearest weather reporting station to the accident site, located about 16 miles to the north, reported the temperature at 30 degrees C. According to the POH chart, with an estimated airplane weight of 8,010 pounds, and temperature of 30 degrees C, the minimum landing distance would have been about 2,265 feet. The published length of runway 18 at the Baldwin Airport was 1,950 feet.

New Richmond Municipal Airport (RNH) was located about 16 miles to the north of Baldwin Airport. The length of runway 14 at RNH was 5,507 feet.

In an interview and email correspondence with the owner/operator (Skydive Twin Cities), he stated that the company's SOP would be updated to include the following language: If landing on a grass runway shorter than 3000' while fully loaded, the aircraft should be taken to the nearest airport that meets or exceeds safe landing requirements. He also stated that they also discussed the accident with their contract pilots and gave them a reminder of their training to use their best judgement in situations like what happened in Baldwin, Wisconsin. They discussed avoiding flying in situations where weather may become an issue and erring on the side of caution in all situations.

Skydive Twin Cities had 17 pilots, most of whom were contractors and used seasonally. The company fleet was comprised of 4 Cessna Grand Caravans, 1 Short Body 114A Cessna Caravan, 1 King Air 90, and 1 SC7 Skyvan.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# CEN16LA052	11/02/2015 1925 CST	Regis# N732MD	Chicago, IL	Apt: Chicago O'hare International ORD
Acft Mk/Mdl CESSNA 208B-B		Acft SN 208B1083	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl P&W PT6A SER		Acft TT 16329	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 135
Opr Name: MULTI-AERO INC		Opr dba: AIR CHOICE ONE		Aircraft Fire: NONE
				AW Cert: STN

Events

1. Taxi-from runway - Abrupt maneuver
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Narrative

On November 2, 2015, about 1925 central standard time, a Cessna 208 Caravan, N732MD, registered to Multi-Aero Inc., of Sarasota, Florida, and doing business as Air Choice One of St. Louis, Missouri, was substantially damaged during taxi after braking to avoid a ground vehicle at the Chicago O'Hare International Airport (ORD). The pilot, co-pilot, and seven passengers were not injured. Night visual meteorological conditions prevailed. The flight was being operated as a commuter passenger flight under the provisions of Federal Code of Regulations Part 135. The flight had originated from Ironwood, Michigan (IWD), and ORD was its final destination.

After landing on Runway 27 at ORD, the flight crew proceeded to taxi to the ramp via Taxiway R. Upon coming to a service road perpendicular to the taxiway, a vehicle moved directly across their taxi path. The flight crew immediately applied brakes to stop. While braking, the airplane's tail section stuck the ground before stabilizing back to a normal stance on the landing gear. The flight crew contacted ground control to inform them about the vehicle incident and resumed taxi to the ramp.

According to a report by the FAA inspector who responded to the accident scene, the driver of the service vehicle (OPS 11) had radioed the tower on frequency 120.75. The driver stated that he just cut off an aircraft on taxiway R. A few minutes later, the driver radioed on frequency 129.9 and reported that he was sorry. Both the pilot-in-command, and the first officer reported that they were cut off by the service vehicle and stopped the aircraft immediately to avoid collision.

A special flight permit was issued by the FAA to ferry the aircraft from ORD to the company repair facility in St. Louis, Missouri, to accomplish repairs. As reported on NTSB Form 6120, an inspection of the airplane by the operator revealed structural damage to the aft pressure bulkhead.

National Transportation Safety Board - Aircraft Accident/Incident Database

Incident Rpt# GAA17IA083	11/28/2016 2030 PST	Regis# N22AF	Salinas, CA	Apt: Salinas Muni SNS
Acft Mk/Mdl CESSNA 560-CITATION		Acft SN 560-0129	Acft Dmg: MINOR	Rpt Status: Prelim Prob Caus: Pending
Eng Mk/Mdl P&W CANADA JT15D 5 SER			Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 091
Opr Name: BILL MASSA CO INC		Opr dba:		Aircraft Fire: NONE
				AW Cert: STN

Events

1. Taxi-from runway - Abrupt maneuver
-

Narrative

On November 28, 2016, at 2030 Pacific standard time, a Cessna 560 airplane, N22AF, struck a helicopter that was parked in designated transient parking area at Salinas Municipal Airport, Salinas, California. The airplane sustained minor damage to the right wing and the pilot was not injured, but the helicopter required major repair. The airplane was registered to Bill Massa Company Incorporated, Salinas, and operated under 14 Code of Federal Regulations Part 91, as a visual flight rules flight. Visual meteorological conditions prevailed for the flight. The flight originated from Salinas, California and had returned to Salinas, California.

During the incident investigation the pilot reported that he turned to the right to avoid an airplane that was too close to the taxi lane centerline. There is a specific distance from the taxi lane centerline that obstacles must remain clear of. The area is defined as the Taxiway/Taxi lane Object Free Area (TOFA). The airplane that the pilot attempted to avoid and the helicopter that was struck, occupied the TOFA. The dimensions of the TOFA do not appear to meet Federal Aviation Administration Airport Design standards, specifically Airport Certification requirements specified per Title 14, Code of Federal Regulations, Part 139.

The investigation is continuing.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# CEN17LA230	06/14/2017 1820 CDT	Regis# N7501Z	Delaplaine, AR	Apt: N/a
Acft Mk/Mdl GULFSTREAM SCHWEIZER A/C CORP	Acft SN 42C	Acft Dmg: SUBSTANTIAL	Rpt Status: Prelim	Prob Caus: Pending
Eng Mk/Mdl HONEYWELL TPE331	Acft TT 3109	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 137	
Opr Name: KIN-CO AG AVIATION INC	Opr dba:	Aircraft Fire: NONE		AW Cert: SPR

Events

1. Maneuvering-low-alt flying - Loss of engine power (partial)
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Narrative

On June 14, 2017, about 1820 central daylight time, an Air Tractor AT64C agricultural airplane, N7501Z, registered to HDS Inc., of Beech Grove, Arkansas, and operated by Kin-Co Ag Aviation Inc., of Beech Grove, Arkansas, was substantially damaged following a forced landed after a loss of engine power near Delaplaine, Arkansas. The commercial pilot sustained minor injuries. The local agricultural flight was being operated under the provisions of Federal Code of Regulations Part 137. Visual meteorological conditions prevailed and a company flight plan was filed. The flight originated at 1800 from the operators private airstrip located in Delaplaine, Arkansas.

The pilot reported that he was enroute to spray a rice field after loading chemicals at the company base. While approaching the field, the engine was not making full power. The pilot elected to executed a forced landing into a rice field. As the airplane landed in the field, the right main landing gear struck a levee and the airplane flipped inverted, resulting in substantial damage to the wings and fuselage. There were no witness to the accident.

Initial examination of the wreckage by and FAA inspector, did not reveal any anomalies. The airplane wreckage was transported to Dawson Aviation, Clinton, Arkansas, for further examination.

National Transportation Safety Board - Aircraft Accident/Incident Database

Accident Rpt# ERA14LA361	07/26/2014 1545 EDT	Regis# N107HA	Wadesboro, NC	Apt: N/a
Acft Mk/Mdl HILLER UH 12E		Acft SN HA3007	Acft Dmg: SUBSTANTIAL	Rpt Status: Factual Prob Caus: Pending
Eng Mk/Mdl ALLISON 250-C20B		Acft TT 11884	Fatal 0 Ser Inj 0	Flt Conducted Under: FAR 137
Opr Name: SUMMIT HELICOPTERS INC		Opr dba:		Aircraft Fire: NONE
				AW Cert: SPR

Events

1. Maneuvering-low-alt flying - Loss of engine power (partial)

Narrative

HISTORY OF FLIGHT

On July 26, 2014, about 1545 eastern daylight time, a Hiller UH-12E, N107HA, was substantially damaged when it impacted terrain near Wadesboro, North Carolina. The airline transport pilot was not injured. Day visual meteorological conditions prevailed and no flight plan had been filed. The local aerial application flight originated at a temporary staging location about 1540. The flight was conducted under the provisions of 14 Code of Federal Regulations Part 137.

According to the pilot, while applying the agriculture product about 75 feet above ground level, he heard three engine compressor stalls, which was followed by a partial loss of engine power. During a forced landing to a nearby road the helicopter rolled over into a drainage ditch and came to rest on its right side, which resulted in substantial damage to the fuselage, tailboom, main rotor blades, and tail rotor blades

PERSONNEL INFORMATION

According Federal Aviation Administration (FAA) records, the pilot held an airline transport pilot certificate with ratings for airplane multiengine land and helicopter, a commercial pilot certificate with ratings for airplane single-engine land and instrument helicopter, and a flight instructor certificate for helicopter and instrument helicopter. He held an FAA second-class medical certificate, which was issued on April 9, 2014. The pilot reported 9,604 hours of total flight experience, of which 5,800 total hours were in rotorcraft and 1,210 hours were in the accident helicopter make and model.

AIRCRAFT INFORMATION

The helicopter was issued a standard airworthiness certificate on June 7, 1974. The most recent 100-hour inspection was conducted on June 18, 2014; at the time of the inspection the helicopter had approximately 11,884 total hours in service. The helicopter was powered by an Allison 250-C20B turboshaft engine, manufactured on April 11, 1980. The engine had been operated for 7,566.6 total hours at the time of the accident.

A review of the maintenance records revealed that the engine was converted from a 250-B17C engine to a 250-C20B engine in September of 1993. At the time of the conversion the engine had 1,381.4 total hours in service. An entry located in the gearbox assembly service record dated October 30, 2007, stated "repair after hard landing." The gearbox repair was completed on November 8, 2008, and no other entries were located revealing any time in service between the repair and when the gearbox was installed on the accident engine. The compressor, gearbox, and turbine assemblies were installed on the accident engine on December 16, 2013, and the engine was subsequently installed on the accident helicopter the next day.

At the time of installation on the accident helicopter, the engine had accrued 7,474.4 total hours in service and the compressor had 5,651.9 total hours in service and 0 hours since overhaul. On May 30, 2014, the gearbox was removed from the accident helicopter with a maintenance record entry that indicated it was "making metal." The entry further stated that the "bearings on N2 tach/gov spur gear shaft going bad." The manner in which the assemblies and the engine were stored prior to installation on the accident helicopter could not be determined.

METEOROLOGICAL INFORMATION

The 1553 recorded weather observation at Monroe Airport (EQY), Monroe, North Carolina, located about 22 nautical miles northwest of the accident location, included wind from 210ø at 6 knots, 10 statute miles of visibility, scattered clouds at 4,200 ft above ground level, temperature 31ø C, dew point 21ø C, and an altimeter setting of 29.99 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

According to photograph provided by an FAA inspector that responded to the accident location, the helicopter came to rest on its right side in a ditch. The ditch was located along a roadway that was perpendicular to the field that the pilot was spraying. The tailboom exhibited damage consistent with being severed by the main rotor blades, the skids were impacted separated, and the windscreen was damaged.

TEST AND RESEARCH

Engine Disassembly

On October 7, 2014, the engine was examined by an NTSB investigator at the engine manufacturer's facility. All fittings were found secured and in place, with the associated torque stripe showing no evidence of rotation. Compressed air was utilized and an air leak was observed at the B-nut on the Pc line; however, according to the engine manufacturer, the leak would not have precluded normal operation of the engine. The compressor was separated and the shims were counted and measured. The measurement was the same as the vibropeened number at the respective case points. Following case separation to facilitate further examination, the N1 rotated but had both tactile and audible resistance noted. N2 rotated smoothly with no resistance noted.

The accessory gearbox was disassembled; the bearings and transfer tube were all labeled as PMA (Part Manufacturer Approval) parts. The No. 2 bearing was examined in place and upon removal the inner race separated and three ball bearings were located outside of the race. The No. 2 bearing and associated hardware was sent to the NTSB Materials Laboratory for further examination. [Further information pertaining to the engine disassembly and examination can be found in the "Engine Examination Report" located in the public docket for this accident.]

NTSB Materials Laboratory Examination of the No. 2 bearing

The No. 2 bearing was examined by NTSB Materials Laboratory personnel. The components of the bearing exhibited discoloration consistent with heat damage and the bearing cage was fractured in multiple locations consistent with fatigue fracture features. The outer diameter of the outer race exhibited fretting damage and coked oil spray patterns. The inner race half, on the compressor-side of the bearing, was uniformly tinted black and was darker in color than the other race half and the outer race revealed circumferential sliding contact marks. The bearing balls were black in appearance. In addition, they were undersized when compared to engineering drawing requirements and displayed signatures consistent with material loss.