Accident Rpt# CEN17LA244	**06/29/2017 740 CDT**	**Regis# N4196Y**	**Stirum, ND**	**Apt: Lisbon Airport 6L3**
Acft Mk/Mdl AIR TRACTOR INC AT 602-NO SERIES		**Acft SN 602-1183**	**Acft Dmg: DESTROYED**	**Rpt Status: Prelim** **Prob Caus: Pending**
Eng Mk/Mdl PRATT & WHITNEY CANADA PT6A-60AG			**Fatal 1** **Ser Inj 0**	**Flt Conducted Under: FAR 137**
Opr Name: WILBUR ELLIS CO		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: SPR

Events

2. Maneuvering-low-alt flying - VFR encounter with IMC

Narrative

On June 29, 2017, about 0740 central daylight time, an Air Tractor AT602 airplane, N4196Y, was destroyed during an in-flight collision with terrain near Stirum, North Dakota. The pilot was fatally injured. The airplane was registered to and operated by Wilbur-Ellis Company as a 14 Code of Federal Regulations Part 137 aerial application flight. Instrument meteorological conditions prevailed in the vicinity of the accident site. The flight was not operated on a flight plan. The local flight originated from the Lisbon Municipal Airport (6L3), Lisbon, North Dakota, about 0700.

Witnesses reported fog in the area, with little or no wind, at the time of the accident. Two witnesses observed the airplane flying low shortly before the accident. As they watched, the airplane descended toward the terrain and they heard the sound of the impact. They estimated that the accident site was about 1/4 mile from their location and added that this was near the extent of the visibility at that time due to the fog.

The airplane impacted a soybean field about 14 miles west-southwest of 6L3. The debris field was approximately 280 ft long by 170 ft wide. The airframe was fragmented, with portions of all control surfaces observed in the debris field. The engine separated from the airframe, and the propeller assembly separated from the engine. Both were located at the accident site. Ground marks consistent in appearance with propeller slashes were located near the initial impact point. The elevation of the accident site was about 1,350 ft.

An airmen's meteorological information (AIRMET) advisory for instrument flight rules (IFR) conditions was in effect at the time of the accident. The accident site located within, but near the southwestern extent, of the advisory area. The current area forecast predicted broken clouds at 2,000 ft mean sea level and visibilities of 3 to 5 miles in mist until 1000 for eastern North Dakota. Weather conditions recorded by the Gwinner Airport (GWR) automated weather observing system, located about 8 miles east of the accident site, at 0735, included calm wind, 9 miles visibility, and overcast clouds at 500 ft above ground level.

Accident Rpt# GAA17CA117 01/17/2017 1645 MST	**Regis# N20361**	**Vernon, UT**	**Apt: N/a**
Acft Mk/Mdl AIR TRACTOR INC AT 802	**Acft SN 802A-0420**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl PRATT & WHITNEY CANADA PT6A-65AG		**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 137**
Opr Name: JASON L. THOMPSON	**Opr dba:**		**Aircraft Fire: NONE**
			AW Cert: SPR

Summary

The pilot of the tailwheel-equipped airplane reported that he attempted to transition a mountain ridge after he had completed an aerial application.ÿHe added that he began to climb to a safe altitude in rising terrain but realized that it was going to be "close to clear" the mountain top. He attempted to turn to the left but noted that the terrain would not allow him to do so. He continued straight ahead and impacted the mountain top about 10 ft from the crest.

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

The pilot reported that there were 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 maintain clearance from mountainous terrain.

Events

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

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Altitude-Not attained/maintained - C
2. Personnel issues-Psychological-Attention/monitoring-Monitoring environment-Pilot - C
3. Environmental issues-Physical environment-Terrain-Mountainous/hilly terrain-Effect on operation

Narrative

The pilot of a tailwheel-equipped airplane reported that he attempted to transition a mountain ridge after he had completed an aerial application. He added that he began to climb to a safe altitude in rising terrain, but realized that it was going to be "close to clear" the mountain top. He attempted to turn to the left, but noted that the terrain would not allow him to do so. He continued straight and impacted the mountain top about ten feet from the crest.

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

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

Accident Rpt# GAA17CA369	**06/26/2017 1600 PDT**	**Regis# N183TC**	**Entiat, WA**	**Apt: N/a**
Acft Mk/Mdl BELL 206B-B		**Acft SN 1805**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Prelim** **Prob Caus: Pending**
			Fatal 0 **Ser Inj 0**	**Flt Conducted Under: FAR 137**
Opr Name: WHITE RABBIT AVIATION LLC		**Opr dba:**		**Aircraft Fire: NONE**

Accident Rpt# GAA17CA311	**05/22/2017 845 AKD**	**Regis# N754KP**	**Skagway, AK**	**Apt: N/a**
Acft Mk/Mdl CESSNA 208-B		**Acft SN 208B1264**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl HONEYWELL TPE331-12JR		**Acft TT 2423**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 135**
Opr Name: KALININ PARTNERS LLC		**Opr dba: ALASKA SEAPLANES**		**Aircraft Fire: NONE**
				AW Cert: STN

Events

1. Enroute - Birdstrike

Narrative

The pilot reported that while en route, about 1,500 ft., he saw a goose approaching the airplane. He added that he attempted to turn and avoid the goose, but the goose impacted the windscreen. The pilot landed the airplane at a nearby airport without further incident.

The airplane sustained substantial damage to the windscreen and fuselage.

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

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	

Summary

The purpose of the flight was for the commercial pilot/owner to pick up passengers at the destination airport and return to the departure airport. The airplane was 33 miles from its destination in cruise flight at 3,300 ft mean sea level (msl) and above a solid cloud layer when the pilot declared to air traffic control (ATC) that he had the destination airport "in sight" and cancelled his instrument flight rules (IFR) clearance. During the 13 minutes after cancellation of the IFR clearance, the airplane's radar track made an erratic sequence of left, right, and 360ø turns that moved the airplane away from the destination airport in a westerly direction. The altitudes varied between about 4,000 and 900 ft msl. Later, the pilot reestablished communication with ATC, reported he had lost visual contact with the airport, and requested an instrument approach to the destination airport. The controller then provided a sequence of heading and altitude assignments to vector the airplane onto the approach, but the pilot did not maintain these assignments, and the controller provided several corrections. The pilot expressed his inability to identify the initial approach fix (IAF) and asked the controller for the correct spelling. The radar target then climbed and subsequently entered a descending right turn at 2,500 ft msl and 180 knots groundspeed near the IAF, before radar contact with the airplane was lost.

Although a review of airplane maintenance records revealed that the airplane was overdue for several required inspections, examination of the wreckage revealed signatures consistent with both engines being at high power at impact, and no evidence of any preimpact mechanical anomalies were found that would have precluded normal operation. Examination of the airplane's panel-mounted GPS, which the pilot was using to navigate the flight, revealed that the navigation and obstruction databases were expired.

During a weather briefing before the flight, the pilot was warned of low ceilings and visibility. The weather conditions reported neara the destination airport about the time of the accident also included low ceilings and visibilities. The restricted visibility conditions and the high likelihood of inadvertent entry into instrument meteorological conditions were conducive to the development of spatial disorientation. The flight's erratic track, which included altitude and directional changes inconsistent with progress toward the airport, were likely the result of spatial disorientation. After reestablishing contact with ATC and being cleared to conduct an instrument approach to the destination, the airplane's flight track indicated that the pilot was not adequately prepared to execute the controller's instructions. The pilot's subsequent loss of control was likely the result of spatial disorientation due to his increased workload and operational distractions associated with his attempts to configure his navigation radios or reference charts.

Postaccident toxicological testing of samples obtained from the pilot revealed the presence of ethanol; however, it could not be determined what percentage was ingested or produced postmortem. The testing also revealed the presence of amphetamine, an opioid painkiller, two sedating antihistamines, and marijuana. Although blood level quantifications of these medications and drugs could not be made from the samples provided, their combined effects would have directly impacted the pilot's decision-making and ability to fly the airplane, even if each individual substance was only present in small amounts.

Based on the reported weather conditions at the time the pilot reported the airport in sight and canceled his IFR clearance, he likely was not in a position to have seen the destination airport even though he may have been flying between cloud layers or may have momentarily observed the ground. His decision to cancel his IFR clearance so far from the destination, in an area characterized by widespread low ceilings and reduced visibility, increased the pilot's exposure to the hazards those conditions posed to the successful completion of his flight. The pilot showed other lapses in judgment associated with conducting this flight at the operational, aircraft, and the personal level. For example, 1) the pilot did not appear to recognize the significance of widespread low ceilings and visibility along his route of flight and at his destination (nor did he file an alternate airport even though conditions warranted); 2) the accident airplane was being operated beyond mandatory inspection intervals; and 3) toxicological testing showed the pilot had taken a combination of multiple medications and drugs that would have likely been impairing and contraindicated for the safe operation of an airplane. The pilot's decision-making was likely affected by the medications and drugs.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's loss of airplane control due to spatial disorientation. Also causal to the accident was the pilot's impairment by the combined effects of multiple medications and drugs.

Events

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

Findings - Cause/Factor

1. Personnel issues-Psychological-Perception/orientation/illusion-Spatial disorientation-Pilot - C
2. Personnel issues-Physical-Impairment/incapacitation-(general)-Pilot - C
3. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-(general)-Not attained/maintained - C
4. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C

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 360ø 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.

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 050øat 10 knots, an overcast ceiling at 400 ft, 2 miles visibility in fog, temperature 16øC, dew point was 15øC, 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 175ø 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.

Incident Rpt# OPS15IA011A 02/17/2015 2145 CST	**Regis#**	**Chicago, IL**	**Apt: Chicago O'hare Intl ORD**	
Acft Mk/Mdl EMBRAER EMB 145LR-LR	**Acft SN 14500877**	**Acft Dmg: NONE**	**Rpt Status: Prelim**	**Prob Caus: Pending**
Eng Mk/Mdl ROLLS-ROYC AE3007 SER		**Fatal 0 Ser Inj 0**		
Opr Name:	**Opr dba:**		**Aircraft Fire: NONE**	

Events

1. Takeoff - Runway incursion veh/AC/person

Narrative

On February 17, 2015, at 2145 central standard time (CST), a runway incursion occurred at Chicago O'Hare International Airport (ORD), Chicago, Illinois, when a Bombardier CRJ-700, N154GJ, entered runway 28R at taxiway F while an Embraer E145, N698CB, was on takeoff roll on runway 28R from intersection EE. The CRJ-700 was operated by GoJet Airlines as GJS3710 and the E145 was operated by American Airlines Group as ENY3084. Both flights were operating under the provisions of 14 Code of Federal Regulations (CFR) Part 121. Night visual meteorological conditions prevailed and no damage or injuries were reported.

Accident Rpt# WPR17LA133 06/27/2017 1403 PDT	**Regis# N151GC**	**Boulder City, NV**	
Acft Mk/Mdl EUROCOPTER EC 130 B4-B	**Acft SN 4402**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Prelim Prob Caus: Pending**
		Fatal 0 Ser Inj 0	**Flt Conducted Under: FAR 135**
Opr Name: PAPILLON GRAND CANYON HELICOPTERS	**Opr dba:**		**Aircraft Fire: NONE**

Events

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

Narrative

On June 27, 2017, about 1403 Pacific daylight time, a Eurocopter EC 130 B4, N151GC, sustained substantial damage following a loss of engine power and subsequent forced landing, during which the helicopter contacted power lines, near Boulder City, Nevada. The pilot and four passengers were not injured, and two passengers sustained minor injuries. The helicopter was registered to American Helicopters LLC, and operated by Papillion Grand Canyon Helicopters as an air tour flight under the provision of 14 Code of Federal Regulations, Part 135. Visual meteorological conditions prevailed for the flight, and a company flight plan had been filed. The flight originated from Boulder City Municipal Airport, Boulder City, Nevada at 1348 with a planned destination of Grand Canyon West Airport, Peach Springs, Arizona.

The pilot reported that as he executed an "S-turn" about 3,000 feet mean sea level, the helicopter made a subtle yaw to the right, which was accompanied by an audible "gong." The pilot lowered the collective and simultaneously noted a yellow engine parameter failure indication on the instrument display. Moments later, the main rotor rpm warning horn activated and was followed by warning lights on the caution warning display. The helicopter began to descend immediately. The pilot elected to perform an autorotation to a nearby helicopter pad. In the attempt to steer away from power lines, the pilot made a left cyclic input; however, the retreating main rotor blade contacted a power line. The pilot continued to maneuver the helicopter and subsequently made an up-slope emergency landing on rising mountainous terrain.

The helicopter was recovered to a secure location for further examination.

Accident Rpt# CEN17LA250 07/02/2017 1800 CDT	**Regis# N9103F**	**Moorhead, MN**	**Apt: Moorhead Municipal JKJ**	
Acft Mk/Mdl NORTH AMERICAN T-28A	**Acft SN 51-7606**	**Acft Dmg: DESTROYED**	**Rpt Status: Prelim**	**Prob Caus: Pending**
Eng Mk/Mdl WRIGHT R-1820 SER		**Fatal 1 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: TROJAN CORPORATION	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: SPE	

Events

1. Approach-VFR pattern final - Controlled flight into terr/obj (CFIT)

Narrative

On July 02, 2015, about 1810 central daylight time, a North American T-28A airplane, N9103F, registered to and operated by Trojan Corporation, Grand Forks, North Dakota, struck a light pole and impacted terrain while on landing approach to Moorhead Municipal Airport (JKJ), Moorhead, Minnesota. The private pilot, the sole occupant on board, was fatally injured, and the airplane was destroyed. The flight was being operated as a 14 Code of Federal Regulations Part 91 personal flight, and no flight plan had been filed. Day visual meteorological conditions existed near the accident site about the time of the accident. The flight originated from Hector International Airport (FAR), Fargo, North Dakota, at 1800, and was originally en route to Lyons Field (47Y), Pelican Rapids, Minnesota.

Shortly after departing FAR, the pilot told the tower controller that he wanted to divert to JKJ. No reason was given. Witnesses saw the airplane flying at low altitude and heard the engine running prior to striking a light pole at a truck waystation, located about 2 miles south of runway 12. The right wing was severed at the root. There was no fire.

Accident Rpt# GAA17CA265 05/07/2017 1450 CDT	**Regis# N993YC**	**Waterloo, IL**	**Apt: N/a**
Acft Mk/Mdl ROTORCRAFT DEVELOPMENT CORP	**Acft SN 71-20367**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Factual Prob Caus: Pending**
Eng Mk/Mdl ALLISON T63-A-720	**Acft TT 4581**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 137**
Opr Name: KLINKENBORG AERIAL SPRAYING & SEEDING IN	**Opr dba:**		**Aircraft Fire: NONE**
			AW Cert: SPR

Summary

The helicopter pilot reported that, while maneuvering at a low altitude for an agricultural application flight, he began flying along the north side of the intended spraying field. He added that he was paying attention to the trees along the field to maintain adequate clearance. He further added that the main rotor blades struck transmission wires and that he then heard a "high pitch sound" coming from the engine and the rpm decrease. The nose pitched up, and the helicopter impacted the ground and rolled onto its right side.

The helicopter sustained substantial damage to the fuselage and empennage.

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

The pilot reported that he had noticed the transmission wires earlier in flight but that he later forgot where they were located.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to see and avoid transmission wires while maneuvering at a low altitude.

Events

1. Maneuvering-low-alt flying - Miscellaneous/other
2. Maneuvering-low-alt flying - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Personnel issues-Psychological-Attention/monitoring-Monitoring environment-Pilot - C
2. Environmental issues-Physical environment-Object/animal/substance-Wire-Awareness of condition - C
3. Environmental issues-Physical environment-Object/animal/substance-Wire-Effect on operation - C

Narrative

The helicopter pilot reported that while maneuvering at a low altitude for an agricultural application flight he began flying along the north side of the intended spraying field. He added that he was paying attention to the trees along the field to maintain adequate clearance. He further added that the main rotor blades struck transmission line wires, and then he heard a "high pitch sound that came from the engine" and the rpm decreased. The nose pitched up and the helicopter impacted the ground and rolled onto its right side.

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