Aviation Investigation Final Report

Location:	FORT MYERS, Florida	**Accident Number:**	MIA00GA184
Date & Time:	June 4, 2000, 10:40 Local	**Registration:**	N127FC
Aircraft:	Bell UH-1H	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Public aircraft		

Analysis

During a fire-fighting flight, witnesses observed the helicopter heading back towards the fire with an external bucket of water. The helicopter was seen in level flight heading in a northeasterly direction away from the lake were the bucket was refilled. A witness said the helicopter banked steeply and went into a nose-low attitude until it disappeared behind trees. Shortly after disappearing behind the trees, the witnesses heard the sound of impact. An aircraft mechanic, who saw the pilot before the flight stated, "...[the pilot]...complained that someone...at 1230 AM...woke him up to tell him they wanted him in at 8:00 AM. He mumbled something about sleepwalking. That he couldn't get back to sleep...I cautioned him about the heat and told him not to overwork himself." On Saturday June 3, 2000, the day before the accident the pilot had put in a 14 hour 20 minute workday, and 3 hours of that was flight time after 1800. According to the pilot's medical records he had been under treatment for chronic hepatitis C, and had been taking interferon for his disease. According to the pilot's girlfriend's statement, "...[the pilot] stopped taking all medications prior to August 1998...during the period of August 1998-June 2000, [the pilot] did not see a doctor for any reason, [the pilot] knew his condition was worsening...the [pilot] would have his good days and his bad, but would still push himself to the limit of almost shear exhaustion, and then almost collapse and rest on days off to maintain his physical ability to work for the State.....[the pilot] was an alcoholic and would not drink for any reason...[the pilot] was extremely tired the morning of June 4, 2000, when she dropped him off at...[the] airport...[he] had a poor night sleep and was still aggravated from receiving the midnight phone call from the...dispatch." A search of the pilot's last FAA flight physical, dated November 9, 1999, did not indicate any pre-exiting disease. However medical records obtained from the Tallahassee, Florida, Veterans Administration, Out Patient Clinic, revealed the following; "[Patient] on interferon for hep c [hepatitis...advised to continue medication, interferon...results showed some changes...and...to continue interferon as ordered...family member took message that labs ok to continue Rx as ordered." The pilot was transferred to Fort Myers on November 1, 1999, and the VA Out Patient Clinic at Fort Myers had no record of the pilot at their facility. The following medical information it was

extracted from the medical records maintained on the pilot by the FAA Civil Aeromedical Institute Aeromedical Certification Division: Applications for 2nd Class Airman Medical Certificates on November 25, 1997, November 9, 1998, and November 9, 1999 each indicate "no" under item 17 ("Do you currently use any medication") and under item 18 ("Have you ever had or have you now any of the following") for sections ("stomach, liver, or intestinal trouble") and x ("other illness, disability, or surgery"). The following information was extracted by the NTSB Medical Officer, from the report of autopsy performed on the pilot by the Office of the District Medical Examiner in Fort Myers, Florida: - Under "Microscopic Examination" is noted, "LIVER: Cirrhosis, portal triads with chronic inflammatory cells, micro and macrovesicular steatosis and focal areas of congestion." The most common symptom of chronic hepatitis C is fatigue. Interferon therapy is often used in individuals with hepatitis C, and had been prescribed by the VA for the pilot. There were, however, no recent medical records to suggest that the pilot had continued that therapy or to indicate how his liver was functioning at or near the time of the accident. The autopsy findings indicate that his disease had progressed to cirrhosis, but the cirrhosis was not noted to be severe. FAA Aviation Medical Examiners are instructed to deny or defer medical certification to the FAA Aeromedical Certification Division for any airmen who have chronic hepatitis with impaired liver function. Examination and test on the Collective Servo Actuator, the Cyclic Servo Actuator, the hydraulic pump, the hydraulic shut-off valve, the engine, and the Bambi (water) Bucket, revealed no discrepancies other then impact damage.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's failure to maintain control of the helicopter for undetermined reasons. Factors in this accident were self-induced pressure and fatigue due to lack of sleep and rest.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: MANEUVERING - AERIAL APPLICATION

Findings
1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
2. PHYSICAL IMPAIRMENT(OTHER ORGANIC PROBLEM) - PILOT IN COMMAND
3. (F) FATIGUE(LACK OF SLEEP) - PILOT IN COMMAND
4. (F) SELF-INDUCED PRESSURE - PILOT IN COMMAND
5. TERRAIN CONDITION - OPEN FIELD

Factual Information

HISTORY OF FLIGHT

On June 4, 2000, about 1030 eastern daylight time, a Bell UH-1H, N127FC, registered to and operated by the United States Department of Agriculture Forest Service as a Title 14 CFR Part 91 public-use local flight, crashed 10 miles south of Southwest Florida International Airport, Fort Myers, Florida. Visual meteorological conditions prevailed, and a company flight plan was filed. The commercial-rated pilot sustained fatal injuries. The flight originated in Fort Myers, the same day, about 0820.

The helicopter was operating as a fire-fighting flight, and had been in the area of a fire for about 1 1/2 hours. The accident occurred after the pilot had refilled the water in the external bucket, and was returning to the fire after filling up at the lake/pond. Witnesses observed the helicopter in level flight heading in a northeasterly direction away from the lake/pond. A witness said the helicopter banked steeply and went into a nose-low attitude until it disappeared behind trees. Shortly after disappearing behind the trees, the witnesses heard the sound of impact. In addition, the witness said, "I saw Helicopter 27 head back to the fire with a full bucket of water, I saw him go down over the pond...and come up with water in it. I saw water trailing the helicopter and the bucket."

A Forestry Service, aircraft mechanic, who saw the pilot before the flight stated, "...I walked into the hangar at 6:45 [0645] [the pilot] was here, complained that someone from Forestry called him at 12:30 [0030] and woke him up to tell him they wanted him in at 8:00 AM. He mumbled something about sleepwalking. That he couldn't get back to sleep. [The pilot] took my truck and went to McDonalds...[pilot] returned with our breakfast, [and] we ate...[the pilot] moved the aircraft to fuel it, I watched him from 3 feet away. He did everything right, and made a normal takeoff. He returned about an hour later...to pick up a helmet and headset. I cautioned him about the heat and told him not to overwork himself."

The accident occurred during the hours of daylight about 35 degrees, 27 minutes North, and 085 degrees, 06 minutes West.

PERSONNEL INFORMATION

The pilot's personal logbook listing his flight hours was not recovered. Based on company records the pilot had all of his flight hours in helicopters. It was estimated that the pilot had about 4,000 hours of total flight time. His employment with the Department of Forestry started on December 23, 1991, and he was transferred to Fort Myers, Florida, November 1999. The pilot received his initial flight training in the United States Army.

METEOROLOGICAL INFORMATION

The weather conditions at Fort Myers, about 10 miles north of the crash site, about the time of the accident were VFR, with a reported visibility of 10 miles; winds were from 030 degrees at 4 knots. The temperature was 84 degrees F, and the dew point was 75 degrees F.

MEDICAL AND PATHOLOGICAL INFORMATION

Dr. Rebecca A. Hamilton performed an autopsy on the pilot, on June 5, 2000, at the Lee-Hendry County Medical Examiner's Office, Fort Myers, Florida. According to the autopsy report, the cause of death was "Multiple blunt force injuries."

Toxicological tests were conducted at the Federal Aviation Administration, Research Laboratory, Oklahoma City, Oklahoma, and revealed, "No ethanol or drugs detected."

A search of the pilot's last FAA flight physical, dated November 9, 1999, did not indicate any pre-existing disease. However medical records obtained from the Tallahassee, Florida, Veterans Administration, Out Patient Clinic, revealed the following; "Progress Notes...Note date: 06/22/1998...09:25...General note...Visit: 06/22/1998...GMED/Nursing...Pt [Patient] on interferon for hep c [hepatitis C]. Most recent Labs done 6/1 topc [Tallahassee Veteran's Administration Outpatient Clinic] showed several improved values. Called home today to report ok and continue Rx. Family member who answered thought pt still taking Rx, but away now, firefighting...Note dated 05/28/1998...phone call to pt home-wife took message. Advised to continue medication, interferon, but platelets low so may bruise easily, be careful...Note date: 05/11/1998...Pt had labs drawn @TOPC [Tallahassee Veteran's Administration Outpatient Clinic] 5/5/98. Results showed some changes...and Pt to continue interferon as ordered...family member took message that labs ok to continue Rx as ordered." The pilot was transferred to Fort Myers on November 1, 1999, and the VA Out Patient Clinic at Fort Myers had no record of the pilot at their facility.

The NTSB Medical Officer, extracted the following medical information from the pilot's medical records obtained under subpoena from the Tallahassee Veteran's Administration Outpatient Clinic:

June 11, 1998 - Nurse's note indicates "... labs ... showed some changes ... patient to continue interferon ... PLT 114, T.BILI 1.0, D.BILI 0.5, AST 88, ALT 90, remainder basically same..."

June 22, 1998 - Nurse's note indicates "Patient on interferon for hepatitis C. Most recent labs ... showed several improved values ... HCT 42.1, WBC 7.2, PLT 142, T.BILI 0.8, D.BILI 0.5, ALK 117, AST 50, ALT 46."

The NTSB Medical Officer, from the medical records maintained on the pilot by the FAA Civil Aeromedical Institute Aeromedical Certification Division, extracted the following medical

information:

Applications for 2nd Class Airman Medical Certificates on November 25, 1997, November 9, 1998, and November 9, 1999 each indicate "no" under item 17 ("Do you currently use any medication") and under item 18 ("Have you ever had or have you now any of the following") for sections ("stomach, liver, or intestinal trouble") and x ("other illness, disability, or surgery").

The following information was extracted by the NTSB Medical Officer, from the report of autopsy performed on the pilot by the Office of the District Medical Examiner in Fort Myers, Florida:

- Under "External Examination" is noted, "...massive traumatic damage of the face and skull..." - Under "Internal Examination" is noted, "... Remnants of the 1790-gram liver have a diffusely nodular, yellow tan, firm surface. The cut hepatic surfaces are minimally congested, yellow tan, extremely firm and diffusely nodular." - Under "Microscopic Examination" is noted, "LIVER: Cirrhosis, portal triads with chronic inflammatory cells, micro and macrovesicular steatosis and focal areas of congestion."

According to the medical records the pilot had been under treatment for chronic hepatitis C. The most common symptom of that disease is fatigue. Interferon therapy is often used in individuals with hepatitis C, and had been prescribed by the VA for the pilot. There are, however, no recent medical records to suggest that the pilot had continued that therapy or to indicate how his liver was functioning at or near the time of the accident. The pilot's girlfriend told investigators that he stopped taking his medication prior to August 1998. The autopsy findings indicate that his disease had progressed to cirrhosis, but the cirrhosis was not noted to be severe. FAA Aviation Medical Examiners are instructed to deny or defer medical certification to the FAA Aeromedical Certification Division for any airmen who have chronic hepatitis with impaired liver function.

WRECKAGE AND IMPACT INFORMATION

The helicopter impacted in a pasture, north of Burgundy Farms Road. The pasture was a large open field located north of a second field. A wooded area separated both fields. South of the crash site was a hedgerow of brush, which ran east and west, and was not dense. Both areas were searched for helicopter parts, and none were found. The pasture that the helicopter impacted in consisted of numerous small ditches that ran north and south. The ditches were uniformly spaced from each other. About 1 mile west of the crash site was the lake/pond that contained the water supply, where the helicopter had been filing its water bucket. The lake could not be seen from the ground. Another low hedgerow was located to the east of the crash site. The ground around the crash site was covered with dry grass, small brush, and sand.

The first ground scars along the wreckage path were located about 145 feet southeast

of the where the helicopter came to rest, and were two impact gouges in the ground. The two gouges were evenly spaced and parallel to each other. The gouge mark to the east was larger then the west gouge mark. There was a long, narrow trench cut into the ground, running from the gouge marks. The trench ran from south to north, in an irregular line towards the helicopter. Pieces of the main rotor blades were found in the gouges and the trench. A circular pattern was found dug into the ground, east of the gouge marks. A piece of tailrotor blade was found on the northwest side of the circular pattern. Northwest of the trench mark was a large "U" shaped pattern in the ground, where a landing skid, door, and other debris were found. The measurements of the skid marks were 61 feet.

The larger of the two gouges measured about 40 feet long, 2 feet 10 inches wide, and 13 inches deep. The smaller gouge was located west (left) of the larger gouge measured about 13 feet long, 2 feet 6 inches wide, and 12 inches deep. An additional gouge located at the north end of a trench was about 2 feet 3 inches wide and 12 inches deep. The area of all gouges and impact marks south of the helicopter's resting place were about 17 feet long, 9 feet 4 inches wide and 9 inches deep.

The tailboom with rotor was found about 6 feet southeast of the fuselage, and was oriented to the northeast. The nose of the helicopter was oriented to the west. Both landing skids were separated from the helicopter. The mast with the main rotor blades were found forward of the main wreckage. The cabin area was destroyed, but none of the helicopter displayed any fire damage. The main transmission had come forward crushing and destroying the overhead switches, circuit breaker panel, center console, to include all the radios, and hydraulic switch.

The engine was found lying north of the helicopter with exhaust facing west. There was a burn pattern in the grass that came from the engine exhaust, and extended from the exhaust extending outward to the north. The engine was removed from the crash for further examination at the manufacturer.

The wreckage was removed from the crash site and examined at a hangar owned by the Lee County Mosquito Control, at Buckingham Airport, Fort Myers, Florida.

Examination of the fuselage revealed the main cabin and roof were heavily damaged. The cockpit was completely fragmented and the main cabin structure was destroyed aft of fuselage station 166 on the right side and aft to fuselage station 74 on the left side. The roof section was broken away from the cabin section and the pylon support structure had shifted forward at the top about 45 degrees. The cargo floor on the left side of the belly section displayed little damage, but the right side was fragmented. The belly fuel cell enclosure on the right side had been compromised, and the fuel cell had been ejected. The cell displayed impact damage and the breakaway valve was closed. The belly fuel cell on the left side was still contained in the structural cavity. The portion of the fuselage structure aft of fuselage station 155 displayed very little damage. The engine deck had received some impact damage, but the engine had separated from the mounts.

The pilot's seat had separated from the cockpit during the impact sequence. The shoulder harness and seat belt were found buckled. The left shoulder harness was found separated from the inertia reel.

The instrument panel had separated from the cockpit structure, was found distorted, and encrusted with sandy soil. Portions of the right side of the panel, along with the instruments from the right side were missing.

The fixed control system between the hydraulic servo actuators and cockpit were completely disrupted from the breakup of the fuselage. Observations of the fixed control system components revealed overload damage. No evidence of pre-impact control disconnects or discrepancies were found.

The hydraulic system displayed impact damage from the breakup of the fuselage. Multiple overload fractures were observed in the hydraulic lines and fittings of the system. The hydraulic pump was found mounted to the transmission sump. Removal of the pump revealed that the drive splines were not damaged. The tailrotor hydraulic servo actuator was found mounted in the aft compartment of the fuselage. The servo appeared undamaged and operable. The three main rotor hydraulic servo actuators had separated from their mounts during the breakup of the pylon area. The hydraulic pump, the three main rotor servo actuator, and hydraulic shutoff valve were removed from the wreckage for further examination.

Examination of the swashplate and main rotor control revealed that the left and right cyclic boost tubes, which attach to the arms of the swashplate inner ring displayed an overload fracture at the fastener holes at the lower ends of the tubes. The upper portions of the tubes remained attached to the swashplate arms. The synchronized elevator control tube displayed an overload fracture at the upper end, and the clevis remained attached to the arm on the swashplate inner ring. The collective boost tube was found with an overload fracture about 3 inches above the fasteners with the upper portion of the tube remaining attached to the collective lever. The swashplate and collective sleeve were in place and appeared operable. One of the drive link trunnion bearings had pulled out of the swashplate outer ring from overload fracturing of the clamp area ring. Both control tubes between the scissor levers and stabilizer bar assembly were overload fractured, as were both of the stabilizer bar damper link tubes. The stabilizer bar assembly was found separated from the main rotor hub by an overload fracture of the four mounting bolts on one side, and pulled out of the pivot bearings on the other side. One of the equalizer levers on the stabilizer bar assembly had separated from the frame, and remained attached to the separated main rotor pitch horn.

The main rotor hub assembly remained attached to the mast, however both blades were found separated from the grips. The hub assembly feathering and flapping bearings operated freely. Both main rotor pitch horns had separated from the grips at the inserts as a result of overload, and were still attached to their respective pitch links. Both main rotor blades were broken up, and displayed extensive impact damage. Overload fractures of the blade spars and

breakup of the blade material was evidence that the blades impacted the ground with high rotational energy.

The main transmission and drive shaft were found separated from the fuselage. Each of the four pylon corner mounts on the support case had been pulled out of the fuselage structure due to overload. The sump had separated from the bottom of the support case due to an overload fracture of the mounting flange. The main rotor mast was separated from the transmission. In addition, the top case and planetary assemblies were removed. The internal gears and bearing of the transmission were found undamaged, and wet with lubricating oil. The freewheeling unit operated without discrepancies. The removal of the main input quill revealed the input pinion and ring were undamaged. The "Kaflex" main input drive shaft was heavely damaged due to an overload fracture of the forward and aft load beam assemblies.

The tailboom was found with an overload fracture at Boom Station 39 (Sta. 39), with the forward portion of the tailboom remaining attached to the aft fuselage structure. The tail rotor, 90-degree gearbox, the 42-degree gearbox, and the tail rotor drive shafts were found still attached to the aft section of the tailboom. Buckling was observed in the lower aft section of the vertical fin, and damage was observed on the left side of the fin, which had been caused by rotational contact of the tail rotor blades.

The tail rotor drive system revealed that the No. 1 tail rotor drive shaft section displayed an overload fracture in the tunnel under the engine. The No. 3 section displayed an overload fracture at Boom Sta. 39, tailboom fracture. Circumferential scratches were observed on the shafts near the fractures. The 42-degree gearbox was found in place, and drive continuity was established. The 90-degree gearbox was found still in place on the fin, and drive continuity was established. All couplings and bearings appeared to have no discrepancies.

The tail rotor assembly was found still attached to the 90-degree gearbox. Continuity of the pitch-change system was verified through the tailboom. One of the tail rotor blades displayed an overload fracture at the tips of the inboard doublers. The separated portion of the tail rotor blade was heavily damaged with large dents and perforations on the inboard surface. One of the larger dents matched the leading edge shape of a main rotor blade. Large dents were seen in the leading edge of the separated tail rotor piece near the tip, and portions of the tip were missing. The tip of the blade spar was swept aft about 60 degrees. The tail rotor blade, which remained attached to the hub, displayed heavy tip damage. The tip damage appeared to have occurred while the blade was rotating, and a portion of the tip material, including the tip block, was missing. The tail rotor hub was found operable.

The cargo hook assembly was removed from the wreckage and tested for operation. The manual release functioned normally. The hook assembly was electrically connected to another UH-IH helicopter, and was found to be electrically functional.

The water bucket or Bambi Bucket was found still attached to the cargo hook and was found near the main wreckage. Five of the eight spokes were found broken, and a gash was

found on the red part of the bucket. The bucket was sent to the manufacturer's distributor for examination.

TEST AND RESEARCH

On June 6, 2000, the hydraulic systems were examined at Bell Helicopter's, Hydraulic Test Laboratory, Fort Worth, Texas, under the supervision of the NTSB investigator-in-charge (IIC). The examination revealed the following:

Collective Servo Actuator, P/N 204-076-052-9, S/N 17852: The servo was powered up on the hydraulic test bench to normal system pressure. The servo operated without any discrepancies in both directions full travel. The rate of motion in both directions appeared normal. Internal leakage was measured at 30 cc per minute, which was below the maximum for new or overhauled servos of 90 cc per minute.

Cyclic Servo Actuator, P/N 205-076-055-101, S/N HR3063: The actuator still contained the upper portion of the overload fractured pilot input rod, and was still attached to the input lever. The servo was powered up on the hydraulic test bench to normal system pressure. The servo operated without any discrepancies in both directions full travel. The rate of motion in both directions appeared normal. Internal leakage was measured at 0 cc per minute.

Cyclic Servo Actuator, P/N 204-076-052-9, S/N 55351: The upper portion of the fractured pilot input rod was still attached to the input lever. The servo was powered up on the hydraulic test bench to normal system pressure. As the servo was operated, it stalled part way through its travel and a large external leak was seen at the dent. The internal leakage of the servo was measured at 20 cc per minute, which was below the maximum allowed of 90 cc per minute for new or overhauled servos. The servo was taken to Bell's Field Investigation Laboratory for disassembly and further examination. After examination by Bell the servo was released to the owners, but was later recovered by the NTSB IIC for further examination at the NTSB Materials Laboratory, Washington, D.C.

The examination of the cyclic servo actuator, S/N 55351, at Bell Helicopter's Laboratory revealed that a 2.3-inch (58 mm) longitudinal crack was found in the aluminum cylinder wall. The crack had occurred in an area where the cylinder wall had been deformed. The cylinder-bearing shield, which had been installed over that area of the cylinder, was also deformed. The cylinder bearing housing that had been installed in that area was found plastically deformed. The piston rod from the assembly was found bent. It was determined that the deformations in all the parts of the cyclic servo actuator were the result of impact damage from the servo assembly with another object. The crack in the servo was the result of an overstress fracture (See Bell's Laboratory report, an attachment to this report).

Sections of the fractured cyclic servo actuator, S/N 55351, were sent to the NTSB Materials Laboratory, Washington, D.C., for verification of Bell Helicopter's Laboratory findings. The NTSB Materials Laboratory examination revealed that the cylinder assembly contained a

longitudinal crack about 2.3 inches in length. Examination of the crack faces revealed features "typical of overstress fracture in aluminum alloys." The inside surface of the cylinder contained scoring and rubbing damage in the vicinity of the crack location. The piston was not submitted for examination. According to the NTSB Material Laboratory factual report, "...no evidence of fatigue cracking, corrosion, or other type of preexisting defect was noted on the components." (See the NTSB Materials Laboratory Factual report No. 01-064, an attachment to this report).

The hydraulic pump was powered up on the test bench and ran without discrepancies. The pump produced 6 gallons per minute flow at 890psi pressure. No leakage was observed. The no-flow pressure relief occurred at 950 psi, which was slightly below the 975psi minimum for a new pump.

The hydraulic shut-off valve was tested on the hydraulic test bench. The valve operated without any discrepancies.

The Caution Panel, and Master Caution Indicator were sent to the NTSB Materials Laboratory, Washington, D.C., for examination of bulb filaments. The examination revealed that the two hydraulic pressure indicator lamps revealed that both lamps "contained stretched filaments...filaments in the other lamps of the Caution Panel revealed no evidence of stretching." The Master Caution indicator contained three lamps. Visual examination revealed only one lamp, contained an intact glass bulb. The filament within this lamp was "severely stretched." The remaining two lamps contained broken glass bulbs and filaments that were damaged, broken, and missing." (See the NTSB Materials Laboratory Factual report No. 00-099, an attachment to this report).

According to the UH-1H flight manual, if the hydraulic reservoir rotates 90 degrees to the right, the suction side of the reservoir is at the top of the reservoir. When air is induced into the suction side of the pump, it will cavitate, pressure will drop, and the hydraulic pressure light on the caution panel could eliminate. These high degrees of bank can occur during impact. In addition, page 5-3 TM55-1520-210-10, flight manual section 5-12 (prohibited maneuvers) states rolls past 60 degrees are prohibited. (See TM55-1520-210-10 flight manual, section 5-12 (prohibited maneuvers), pages 5-3, 7-1,7-2,7-4, and 7-5, an attachment to this report).

On August 17, 2000, the engine from N127FC was torn down and examined at Honeywell's facilities, Phoenix, Arizona, under the supervision of Mr. John Lovell, Air Safety Investigator, NTSB Southeast Regional Office Miami, Florida. The examination revealed that no discrepancies were found, and that the degree and type of damage observed was indicative of engine rotation and operation at the time of impact. (See Honeywell's Engine Teardown Report, an attachment to this report).

At the request of the NTSB IIC the Department of Forestry sent the Bambi Bucket to C.T. "Rust" Boys, President of Field Support Services, Atlanta, Georgia, for a determination of the type of damage to the Bambi Bucket. On October 16, 2000, the report was "E" mailed to the

Department of Forestry and revealed, "...the damage...on the Model 2732...indicated...that the bucket must have had a load of water when it struck the ground...5 of the 8 IDS spokes were either badly bent or had clevis pin holes broken. The shell was torn open with no apparent hard object damage (it appeared to be blown out) and there was evidence of mud caked on the upper part of the shell and suspension...we can't draw a firm conclusion from the mud, but it may have been made with water from the bucket at impact."

ADDITIONAL INFORMATION

At the time of the accident the pilot was living with his girlfriend and his son. The pilot's girlfriend was interviewed on June 7, 2000. At the time of the interview she answered all of the questions, but was too upset to make a written statement. She was able to tell the NTSB investigator-in-charge (IIC) of the pilot's activities 24 hours before the accident.

She said, that on Saturday June 3, 2000, she drove the pilot to the airport at 0700. At 1930, she came back to the airport to pick him up. Forestry Service personnel at the airport told her, that the pilot had to fly a mission, and she went back home. The pilot called her from the helicopter about 2030, and she picked him up at the airport at 2120. He had put in a 14-hour 20-minute workday, and 3 hours of that was flight time after 1800. It took them about 15 minutes to arrive home.

According to the pilot's girlfriend, on the night before the accident, she went to bed around 2300. Before going to bed she fixed the pilot some cereal and something to drink because he was "thirsty." She did not remember what time he came to bed, but at 0030 the pilot received a call from the dispatcher at work about what time he was to report that Sunday morning. She said he was very upset about the call, and was aggravated. She woke up at 0100, and thought he was sleeping. She went back to sleep and did not remember anything until 0530, when the pilot woke up. She said he was "thirsty" again and she fixed him some "Gator Aide." She drove him to the airport and they arrived there about 0600. The interview was ended.

The pilot's girlfriend could not be located after the interview for follow-up questions until June 14, 2001. At that point she gave a statement to a Forestry Service investigator, the statement was transcribed and signed.

According to the pilot's medical records he had been under treatment for chronic hepatitis C, and had been taking interferon for his disease. According to her statement, "...[the pilot] stopped taking all medications prior to August 1998, [before she and the pilot were dating] due to the fact he didn't think it was working, and the medicine was making him feel worse. [She] remembers seeing the medication in the refrigerator, but then the [pilot] removed his medication...during the period of August 1998-June 2000, [the pilot] did not see a doctor for any reason, [the pilot] knew his condition was worsening and was striving to meet the State's vestment policy for retirement benefits [according to the pilot's employer he would have been vested December 23, 2001]...the [pilot] would have his good days and his bad, but would still

push himself to the limit of almost shear exhaustion, and then almost collapse and rest on days off to maintain his physical ability to work for the State...[the pilot, his son, and girlfriend] all discussed his financial planning and death benefits for his family/surviving members Friday night (June 2, 2000), he also told them not to sue if anything should happen for all would be covered and provided..." In addition, his girlfriend said, "...[the pilot] was an alcoholic and would not drink for any reason...[the pilot] was extremely tired the morning of June 4, 2000, when she dropped him off at...[the] airport...[the pilot] had a poor night sleep and was still aggravated from receiving the midnight phone call from DOF [Department of Forestry] dispatch."

The helicopter was released to Mr. David L. Parsons, Aircraft Mechanic Supervisor, State of Florida, and Department of Agriculture, on June 7, 2000. The engine was released to Mr. Parsons, on August 17, 2000. Two of the three hydraulic servos were released to Mr. Parsons, on July 19, 2000, and shipped to Mr. Paul Markowitz, US Forestry Service, Boise, Idaho, on August 17, 2000. The third servo was sent to Mr. Parsons, on June 4, 2001, and on June 12, 2001, he acknowledged receipt of the servo sent from the NTSB Laboratory.

Pilot Information

Certificate:	Commercial	**Age:**	49,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	November 9, 1999
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	4000 hours (Total, all aircraft), 4000 hours (Total, this make and model), 3900 hours (Pilot In Command, all aircraft), 91 hours (Last 90 days, all aircraft), 34 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N127FC
Model/Series:	UH-1H UH-1H	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Utility	**Serial Number:**	66-01147
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	May 19, 2000 100 hour	**Certified Max Gross Wt.:**	9500 lbs
Time Since Last Inspection:	41 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	7021 Hrs	**Engine Manufacturer:**	ALLIED/HONEYW
ELT:	Installed	**Engine Model/Series:**	T53-L13B
Registered Owner:	USDA FOREST SERVICE FEPP	**Rated Power:**	1300 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RSW ,31 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	10:00 Local	**Direction from Accident Site:**	350°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	30°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	84°C / 75°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	, FL (X56)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	08:20 Local	**Type of Airspace:**	

Airport Information

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

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	26.509557,-81.699653(est)

Administrative Information

Investigator In Charge (IIC):	Yurman, Alan
Additional Participating Persons:	PAUL KAHLER; TAMPA , FL DAVID L PARSONS; TALLAHASSEE , FL JACK SUTTLE; FORT WORTH , TX PAUL N MARKOWITZ; BOISE , ID
Original Publish Date:	October 17, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=49340