

Timothy W. Monville Sr. Air Safety Investigator Eastern Region

Date: April 20, 2018 Person Contacted: Robert Gonzalez NTSB Accident Number: ERA17FA339

Narrative:

Federal Aviation Administration (FAA) inspector Robert Gonzalez was contacted by phone on September 29, 2017, at 1210 EDT. He was called at

He indicated that a witness who was located at a bee farm adjacent to the accident site reported hearing a sputtering and pop sound from the engine, followed by the engine quitting. The witness then observed the helicopter the descending, and during this time saw a piece of main rotor blades separate. The witness drove around to the accident site.

The digest was reviewed with him during the phone call and he agreed with the content.



Timothy W. Monville Sr. Air Safety Investigator Eastern Region

Date: April 20, 2018 Person Contacted: Andy Hickox NTSB Accident Number: ERA17FA339

Narrative:

Mr. Andy Hickox (previous owner of N152AH) was contacted by phone on October 1, 2017, at 1048 EDT. He was called at The phone rang and there was no chance leave a voicemail message.

He was again attempted to be contacted on October 2, 2017, at 1209 EDT. The phone call was made to the same phone number. The phone rang and there was no chance to leave a voicemail message.

The digest was typed up.



Timothy W. Monville Sr. Air Safety Investigator Eastern Region

Date: April 20, 2018 Person Contacted: Andy Hickox NTSB Accident Number: ERA17FA339

Narrative:

Mr. Andy Hickox (previous owner of N152AH) was contacted by phone on October 2, 2017, at 1211 EDT. He was called at his home number of He answered the call and indicated he preferred me to call his cell phone number of He provided an email address of

He was called the same day at 1219 EDT at

At the beginning of the phone call he was advised that the NTSB is a federal agency mandated by Congress to investigate aircraft accidents, and NTSB has no authority to take any action against any individual. He was also informed that the purpose of an NTSB investigation is for safety only, and any person NTSB talks with has the right to representation; he agreed to the interview "to a point."

He indicated that when he sold the rotorcraft gyroplane to the accident pilot, he provided the construction manual to him.

The RAF 2000 was designed in Canada. It had a fuel tank capacity between 20 and 21 gallons. He was asked if the on-board the main rotor and engine tachometer's record and retain information, and whether he had any paperwork associated with them that gave a manufacturer, or model number. He was advised that these recorders were retained for the NTSB investigation. He was also asked if he was aware of any previous problems with the main rotor blades, and he replied he was not. He was also asked if he had any issues related to the ignition module, and he indicated he had not.

He indicated that while he only the rotorcraft gyroplane a horizontal stabilizer was installed; however, he was not sure if the accident pilot kept the horizontal stabilizer installed.

He indicated that he spoke with the accident pilot last week. And during that conversation the accident pilot indicated that he left Georgia and went to Alabama for flight training.

He also indicated that the accident pilot had called him and advised he was installing a transponder and had a question for him as to how to remove the instrument panel. During that conversation and he asked the accident pilot how it was going, and he replied "good."

He was asked if he could provide pictures of the rotorcraft gyroplane, he advised he was search his devices and let me know if he had any.

The digest was e-mailed to him for review on April 20, 2018. He did not reply.



Timothy W. Monville Sr. Air Safety Investigator Eastern Region

Date: April 20, 2018 Person Contacted: Robert Gonzalez NTSB Accident Number: ERA17FA339

Narrative:

Federal Aviation Administration (FAA) inspector Robert Gonzalez was contacted by phone on October 2, 2017, at 1407 EDT. He was called at

He indicated that a witness who was located at a bee farm reported seeing the rotorcraft gyroplane heading in a north-northwest direction between 50 and 60 ft above the height of the trees. The witness indicated that the rotorcraft gyroplane flew over their position and the engine was running at that time. They heard two pop sounds followed by a simultaneous total engine failure. The witness reported that when the rotorcraft gyroplane was over a tree line, he heard one big pop sound followed by seeing a piece of main rotor blade separate. The witness indicated that the time that the engine had stopped. He lost sight of the rotorcraft gyroplane because of trees, and then heard the impact.

Inspector Gonzalez indicated that he inspected the pilot's hangar at the Bob White Field Airport (X61), Zellwood, Florida, and noticed a set of main rotor blades in the hangar.

He indicated that the accident flight departed X61 at about 1000 hours. The accident pilot did not hold a Sport Pilot pilot certain the flight instructor who instructed the accident pilot has a pilot certificate number of

He indicated that the pilot's wife was devastated as a result of the accident.

The digest was reviewed with him during the phone call and he agreed with the content.



Timothy W. Monville Sr. Air Safety Investigator Eastern Region

Date: April 20, 2018 Person Contacted: Andy Hickox NTSB Accident Number: ERA17FA339

Narrative:

Mr. Andy Hickox was contacted by phone on October 3, 2017, at 1200 EDT. He was called at

At the beginning of the phone call he was advised that the NTSB is a federal agency mandated by Congress to investigate aircraft accidents, and NTSB has no authority to take any action against any individual. He was also informed that the purpose of an NTSB investigation is for safety only, and any person NTSB talks with has the right to representation. With respect to communicating with NTSB, he spoke with a flight instructor who told him it was OK to talk to NTSB, and provide information. He agreed to the interview without representation.

He was asked if he knew what the upper and lower tachometers were for. He indicated that the upper tachometer was for the main rotor, and the lower tachometer was for the engine. He was also asked if there was any issues with the rotorcraft gyroplane. He indicated that the only issue he had was a spring had failed on the throttle, which required him to baby the throttle for landing he indicated that the last few times he flew the rotorcraft gyroplane was for tracking issues of the main rotor. He reported that the rudder pedals were controlled by cable in a sheath. He was asked a question about the flapper/stopper and reported that they spin out due to centrifugal force at rpm, and at shutdown they keep the blades from flopping in the wind. He indicated that the propeller blade and the main rotor blades serial numbers were located in the construction manual.

He indicated that he got into flying at about 50 years of age and he farms for a living. He indicated that he had about 218 hours on the rotorcraft gyroplane when he sold it, and he sold it because he was afraid of it. He indicated that it took him about 100 hours to feel comfortable flying the rotorcraft gyroplane. When he sold the rotorcraft gyroplane to the accident pilot, he (Andy) did not fly with him because he had not flown in several years. He (Andy) trained in the

rotorcraft gyroplane with both horizontal stabilizer removed, and reported that with both horizontal stabilizers installed, it made a difference in flying characteristics. While flying the accident rotorcraft airplane, he reported experiencing an issue with pilot induced oscillation (PIO). While he owned the rotorcraft gyroplane, he had never experience a loss of engine power; however, he did practice in-flight an engine failure. In that maneuver he would pitch to maintain airspeed at 60 mph. The rotorcraft gyroplane is considered a high thrust aircraft, and when you experience a loss of engine power, the nose pitches up. He also indicated that control input is slow to "show up."

Since he had not flown or operated the rotorcraft gyroplane in some time, he would run the engine once every couple months.

The accident pilot picked up the rotorcraft gyroplane either on July 5 or July 6, 2017. The main rotor blades were removed to transport the rotorcraft gyroplane. Since purchasing it, the accident pilot received instruction in Alabama by an RAF instructor named Dofin, who also owns N918DF.

The accident pilot called him twice since purchasing. During one of the calls the accident pilot indicated that as he flew it, it (vibration) would go away. The accident pilot also called him on September 18, 2017, and advised him that he was putting in a transponder. During that conversation the accident pilot told him he was flying and enjoying the rotorcraft gyroplane.

The digest was e-mailed to him for review on April 20, 2018. He replied on May 1, 2018, at 2205 EDT, with, "Mr. Monville, the notes looks to be accurate. Thanks Andy Hickox."



Timothy W. Monville Sr. Air Safety Investigator Eastern Region

Date: April 20, 2018 Person Contacted: Christopher Lord NTSB Accident Number: ERA17FA339

Narrative:

Mr. Christopher Lord was contacted by phone on April 19, 2018, at 0842 EDT. He was called at He previously provided an email address at

At the beginning of the phone call he was advised that the NTSB is a federal agency mandated by Congress to investigate aircraft accidents, and NTSB has no authority to take any action against any individual. He was also informed that the purpose of an NTSB investigation is for safety only, and any person NTSB talks with has the right to representation; he agreed to the interview without representation.

Mr. Lord was previously contacted by NTSB, related to NTSB investigation ERA18LA117. During the previous contact, he indicated that he is a Federal Aviation Administration (FAA) Designated Pilot Examiner (DPE).

He was contacted to get general information regarding a fatal RAF 2000 rotorcraft gyroplane accident being investigated by myself.

He indicated that he holds a FAA private pilot certificate with airplane single engine land and instrument airplane ratings, with about 1,500 to 1,600 hours. He also has about 13 hours in rotorcraft helicopters, but he does not have a rotorcraft helicopter rating. He holds a commercial pilot certificate with rotorcraft gyroplane rating, and has about 3,000 flight hours in rotorcraft gyroplane's. He holds a flight instructor certificate with rotorcraft gyroplane rating, and has about 2,800 hours as a flight instructor in rotorcraft gyroplane's. He also holds a Sport Pilot Instructor certificate with airplane single engine land and powered parachute ratings. He also is a DPE, which he has had for about 4 to 5 years.

He indicated that the RAF 2000 was originally built in Canada and as designed with a Subaru car engine installed, has a very high thrust line versus center of gravity location. Because of that, the nose has a tendency to drop down when power is applied, but would pitch up when power was reduced. He also indicated because it was not originally equipped with a horizontal stabilizer on the tail, it would be susceptible to power pushover (PPO) and pilot induced oscillation (PIO). A company in South Africa now holds the license for them, reference

He indicated that some of the RAF 2000 rotorcraft gyroplane are equipped with a horizontal stabilizer. The difference between a rotorcraft helicopter and a rotorcraft gyroplane is that a flight control input to a rotorcraft gyroplane would not translate immediately; whereas, flight control input to a rotorcraft helicopter would translate immediately. He indicated that because it had a big engine with high horsepower, the propeller was moved up to clear the tailboom.

With a RAF 2000, if you have a loss of engine power the nose will have a tendency to pitch up, and the pilot would have a tendency to push forward on the control stick. The pitch up would be because the thrust line is above the vertical center of gravity location.

With respect to the flight instructor who trained the accident pilot, he knows him casually. He also provided NTSB for reference the name of an instructor who is a RAF 2000 expert (Duane Hunn), phone number and e-mail address

He indicated during the call that he has a RAF 2000 in his hangar (N876JH). He was asked to document whether the electrical connection beneath the ignition module had a secondary locking device installed on that helicopter. During the call he FaceTime'd NTSB, and showed the electrical connection on that rotorcraft gyroplane. The electrical connection had what appeared to be electrical tape around it. He was asked to provide photographs, which he did the same day.

He indicated that if the main rotor blades were deformed up, that scenario would occur if the rotors were loaded to the extreme. If air would go over the top of the main rotor, the main rotor rpm would decrease and the main rotor blades would flex down and contact the rudder and tailboom. And the gyroplane would pitch forward.

The issue of a fixed wing pilot flying a rotorcraft gyroplane was discussed, and he indicated that typically a (PIO) would occur. As the gyroplane has a delayed fuselage reaction to the movement of the rotor system.

He indicated that if the engine were to hiccup or lose power, an inexperienced pilot would have a tendency to push forward on the control stick rapidly causing the aircraft to pitch forward.

The digest was e-mailed to him for review on April 20, 2018. He replied the same day at 1638 EDT with comments that were incorporated into the narrative. The corrected digest was e-mailed to him on October 1, 2018.



Timothy W. Monville Sr. Air Safety Investigator Eastern Region

Date: April 20, 2018 Person Contacted: Dofin Allen Fritts NTSB Accident Number: ERA17FA339

Narrative:

Mr. Dofin Fritts was contacted by phone on April 19, 2018, at 1254 EDT. He was called at and left a voice mail message. He returned the call the same day at 1321 EDT, from the same phone number. His e-mail address is

At the beginning of the phone call he was advised that the NTSB is a federal agency mandated by Congress to investigate aircraft accidents, and NTSB has no authority to take any action against any individual. He was also informed that the purpose of an NTSB investigation is for safety only, and any person NTSB talks with has the right to representation; he agreed to the interview without representation.

He indicated at the on-set of the call that he had been expecting someone to call him. He was advised that on October 3rd, I contacted the Brewton Municipal Airport (12J), Brewton, Alabama, and asked airport personnel to have him (Mr. Fritts) call me. He advised that he did not get that message. He (Mr. Fritts) was also sent a copy of the email to 12J personnel.

He provided a pilot certificate number of **Sectors** He indicated that with respect to his flying experience, he held a British pilot certificate with a glider rating. He then came to the United States where he obtained his US FAA private pilot certificate with airplane single-engine land rating. He began flying single seat rotorcraft gyroplanes in 1990. He then obtained his US FAA commercial pilot certificate with airplane single and multi-engine land, instrument airplane ratings. He obtained a flight instructor with airplane single engine rating, then added an instrument rating onto his flight instructor. He then added on a rotorcraft gyroplane rating onto his certificate and then added that same rating in 1994 to his flight instructor certificate. He began teaching in fixed wing single engine airplanes accruing between 300 and 400 hours, then began teaching in rotorcraft gyroplanes and test flying rotorcraft gyroplanes for people who had built them. He has about 1,500 hours in fixed wing type aircraft, and close to

5,000 hours in rotorcraft gyroplanes, of which at least 2/3 is as an instructor. His flight instructor certificate expires in November 2018 (FAA records depict it expires on 11/30/2018). He indicated that he does not log all his rotorcraft gyroplane time. He does not log rotorcraft gyroplane time when flying non-certificated rotorcraft gyroplanes. He indicated that he has been flying less and less, slowing down in the past 5 to 6 years.

He indicated that after Mr. Pensinger purchased the airplane in either North Carolina or Georgia (FAA records indicate that the rotorcraft gyroplane was purchased from the previous owner in Waycross, Georgia). After purchasing, he brought it to 12J. After some time at 12J, Mr. Pensinger took the rotorcraft gyroplane home to the Bob Whitefield Airport (X61) Zellwood, Florida, where he also taught him.

He has prepared syllabi for getting an initial rotorcraft gyroplane rating, adding on that rating to private pilot or sport pilot certificates, the later of which is what the accident pilot did. In general, he tells pilots adding on a rotorcraft gyroplane rating to a Sport Pilot certificate typically takes a minimum of 6 hours, but when he teaches, it is done to the point of being competent, which is usually between 6 and 15 hours. He indicated that the accident pilot had closer to between 15 and 20 hours dual instruction, which he logged in the pilot's logbook and his own pilot logbook.

With respect to training of the accident pilot, because he did not have a recent flight review, he (Mr. Pensinger) progressed like he was a student pilot. The training was conducted at 12J and X61 airports. He indicated that he gave the accident pilot a pre-solo written test, and endorsed his pilot logbook for solo flight. He (Mr. Fritts) also logged ground training given to the accident pilot. Mr. Fritts also indicated that he observed the accident pilot fly solo about 5 to 6 hours at the training airport. At the conclusion of his training, he recommended the accident pilot fly solo flights.

During (Mr. Pensinger) solo training, 3 bags totaling 120 pounds were added to the passenger seat. When Mr. Pensinger felt comfortable flying, he (Mr. Fritts) would gradually remove some of the weight. Mr. Pensinger was also informed that every 90 days he would need to be checked out in the aircraft. Since the training was completed, Mr. Fritts had not heard back from Mr. Pensinger.

When he (Mr. Fritts) flew the rotorcraft gyroplane, it was not equipped with a horizontal stabilizer installed on the mast, or on the tail. The accident rotorcraft gyroplane was equipped with a standard pitch trim set up, which preloaded the main rotor blades with springs. He indicated that the rotorcraft gyroplane flew well, the rotor was smooth, and it was equipped with a carbureted 2.2 Subaru engine. He indicated that Mr. Pensinger had a set of main rotor blades, and the main rotor blades that were installed at the time did not have that many hours. He indicated that the serial number is located on the root end of each main rotor blade.

With respect to the training he had given the accident pilot, he was asked if they ever practiced an engine-out maneuver. He indicated that as part of the training they did perform engine-out maneuvers, that were performed on final approach, the base leg of the airport traffic pattern, and also on the downwind leg of the airport traffic pattern. As part of the training concerning engineout maneuvers, he discussed with Mr. Pensinger the importance of maintaining airspeed. With respect to the engine out maneuver, he was asked how that was demonstrated. He replied that the method he utilized (engine rpm between 2,800 and 3,000 rpm) would produce the same aerodynamic drag as an engine at idle. That power setting resulted in greater drag than if the propeller was stopped, which would result in an increased rate of descent. He taught Mr. Pensinger to maintain best glide airspeed of 60 mph during the descent. He was asked that as part of his training of the accident pilot whether he actually secured/shut down the engine in-flight to demonstrate a loss of power, he indicated that he had not. He did indicate that in previous years if there was a light crosswind, he might secure the engine; however, he stopped the practice 10 years ago. He also indicated that he would reduce the engine to idle on takeoff, which would demonstrate to Mr. Pensinger how quickly the airspeed would bleed off.

He was asked how the RAF 2000 behaved with the engine operating between 2,800 and 3,000 RPM during a simulated loss of engine power maneuver. He indicated that the common misconception in the aviation community with that type rotorcraft gyroplane is that the nose will pitch up when the engine loses power because of the location of the thrust line being above the center of gravity. He indicated in that scenario (engine power loss), if a pilot were to remove his hand from the control stick, the cabin will "swing back" and the airspeed will be maintained within approximately 5 mph of the trimmed airspeed. If the trimmed airspeed were between 65 and 70 miles per hour, and the engine lost power, the rotorcraft gyroplane would descend and would be stable. If a pilot were to keep his hands on the control stick when a loss of engine power occurred and did not let the "controls float", the wing (rotor) would pitch down.

He clarified that a quick decrease of thrust would first cause the cabin (only) to swing nose down, the stick position would appear to move forward in the cabin. If the pilot held the stick in its original position the pilot would in essence be applying back/up pressure on the stick causing a pitching up reaction to the rotor which would then cause the cabin to swing nose up.

The steps or sight picture for a loss of engine power in the RAF 2000 would be:

- 1. Allow/trim for best glide airspeed of 60 mph
- 2. Need to relax the control stick
- 3. The cabin will swing back giving a nose-down sight picture

He indicated that Mr. Pensinger performed well when he would quickly reduce or increase power. He (Mr. Pensinger) had little to no tendency for pilot induced oscillation (PIO).

In the United States, he would be considered a builder/distributor of the RAF 2000 rotorcraft gyroplane. He was asked if there was any airworthiness issues related to the rotorcraft gyroplane how would that information be disseminated. He indicated that airworthy issue should be addressed to the South African Rotary Air Force, who manufactures the RAF 2000. He indicated that he would provide NTSB a phone number and email address for the Rotary Air Force in South Africa.

He indicated that his company (RAF Canada) measured cabin swing with and without a horizontal stabilizer installed. He was not part of the testing and was only told of the test at a

later date. He never had access to the testing data for the test that occurred in either 2000 or 2001, and was done by or for Israeli. The rights to produce the RAF 2000 was sold to Rotary Air Force in South Africa. He was asked if he had a copy of the results of the testing of the cabin swing, and he indicated he does not.

He was asked if there was any instructions to provide a secondary locking device at the electrical connection to the ignition module. He replied there was not, but added that the electrical cable is usually supported by the builder with several tie wraps.

He indicated that after learning of the accident, he talked to the pilot's wife. She indicated during that phone call that her husband was flying to a nearby airport for lunch with friends. He indicated that he did some research of the accident location and realized the nearest airport was about 3 miles away. Mr. Fritts wondered if the flight encountered turbulence, reporting that a gyroplane pilot would reduce power and use pitch to slow to best glide speed; however, a fixed wing pilot flying a gyroplane encountering turbulence will, "usually increase power and over controlling in pitch increases oscillation (PIO, pilot induced oscillation) until retreating blade stall occurs."

He was advised that in the accident, one main rotor blade was fractured near the hub and the vertical stabilizer and rudder were cut by the main rotor. He inquired about the condition of the propeller blades, and was advised that they were fractured near the hub. He proposed possible scenarios in which the main rotor would cut the vertical stabilizer and rudder. In that instance the main rotor would also cut the keel near the location where the rudder cables come out. He relayed that if the main rotor were to hit the vertical and rudder, it would likely happen in 3 places. He indicated that there would likely be paint residue on the leading edge of the main rotor blade.

He also surmised that a retreating blade stall would also call a main rotor blade to contact the tail, but without engine power a retreating blade stall cannot occur.

He indicated that the horizontal stabilizer reduces movement of the cabin. He indicated that he flies a RAF 2000 with and without the horizontal stabilizer, and during his flight training with an owner, would let the owner decide if he wanted to have one installed or not. Mr. Pensinger talked to him about the horizontal. Mr. Fritts indicated that if a horizontal stabilizer is installed, the performance is degraded. For example, if the horizontal stabilizer was installed and the engine quits, the descent rate would be higher. And for a rotorcraft gyroplane that does not have a horizontal stabilizer installed, he indicated that there would be, "a little more" pendulum effect, but if the aircraft were allowed to fly, there will be no effect on the airspeed. He reiterated that a pitch up and pitch down would be cause solely by the pilot.

The digest was e-mailed to him for review on April 20, 2018. He replied on April 24, 2018, at 2326 EDT with comments that were incorporated into the narrative. The corrected digest was e-mailed to him on October 1, 2018.