National Transportation Safety Board
Aviation Accident Final Report

Location:	CHICAGO, IL	**Accident Number:**	CHI98FA296
Date & Time:	08/01/1998, 2200 CDT	**Registration:**	N5340F
Aircraft:	Cessna 340A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal, 3 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot reported the airplane decelerated during the takeoff roll. He applied the brakes and as he advanced the throttles to full power the airplane accelerated. The airplane cleared the end of the runway then stalled into Lake Michigan, flipped inverted and sank. One passenger reported that it felt as if someone put on the brakes. One passenger drowned. The pilot used 32' of manifold pressure for takeoff versus 37.3' as placarded. The pilot operating handbook lists normal takeoff speed as 91 KIAS, however the airplane was equipped with vortex generators. The pilot reported looking for 105 to 110 KIAS for takeoff. No evidence was found of the pilot having a multi-engine rating. No evidence of a mechanical failure/malfunction was found.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's improper use of the throttle in not using full power for takeoff, the pilot's failure to use proper aborted takeoff procedures, and the inadvertant stall/mush. A factor associated with the accident was inadequate preflight/planning by the pilot.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF

Findings
1. (F) PREFLIGHT PLANNING/PREPARATION - INADEQUATE - UNQUALIFIED PERSON
2. LACK OF CERTIFICATION - PILOT IN COMMAND
3. (C) THROTTLE/POWER CONTROL - IMPROPER USE OF - UNQUALIFIED PERSON
4. (C) ABORTED TAKEOFF - IMPROPER - UNQUALIFIED PERSON
5. (C) STALL/MUSH - INADVERTENT - UNQUALIFIED PERSON

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
6. TERRAIN CONDITION - WATER

Factual Information

HISTORY OF FLIGHT

On August 1, 1998, at 2200 central daylight time, a Cessna 340A, N5340F, operated by a private pilot collided with Lake Michigan while taking off on runway 18 (3,899' x 150') from the Merrill C. Meigs Field (Meigs Field), Chicago, Illinois. One passenger drowned as a result of the accident. The pilot and two other passengers received minor injuries. The 14 CFR Part 91 personal flight was operating in visual meteorological conditions without a flight plan. The flight was originating at the time of the accident.

The pilot and passengers stated they had flown from Louisville, Kentucky, to Meigs Field earlier in the evening to have dinner in Chicago. Following dinner they returned to Meigs Field in preparation for their flight back to Louisville.

The following information was gathered from the pilot through an interview on the night of the accident, three subsequent telephone interviews, and the NTSB Form 6120.1/2 which he completed. The pilot stated he was aware that the airport was going to be closing so when they arrived back at the airport he went out to begin the aircraft preflight while the passengers were inside the terminal building. Once the passengers got to the airplane the pilot had finished his preflight and they boarded for takeoff. He stated he instructed the front seat passenger to keep her "feet back and not to touch anything with her hands."

The pilot reported that he contacted the tower and taxied to the runway where he performed an engine run up while waiting for another aircraft to depart. The pilot reported, that after being cleared for takeoff, he back taxied on the runway using all available runway. He then began the takeoff roll and as they were approaching 100 knots he told the passenger they were about to fly at which time the passenger stated "...don't worry I won't do anything." The pilot reported that a second later, when approximately 2,400 feet down the runway, "...we lost power on the left engine (I think) I believe my right foot was holding the right rudder completely in." He reported that he did not recall seeing split needles. In an interview two days after the accident the pilot stated he thought he recalled seeing "split needles", but he wasn't sure. He also stated during the interview that he did not have any problem maintaining directional control of the airplane and he had even pressure on both rudder pedals. He reported he pushed the throttles from 32" to full power and he intended on moving the fuel boost pumps from low to high, but inadvertently moved them to the off position. He reported he put his hand back on the throttles and was starting to pull the power back and apply brakes when power was regained. He reported that the airspeed had dropped to 60 knots, but the last time he looked at the airspeed indicator it was at 80 knots and both engines were producing power. The pilot reported there was approximately 900' of runway remaining so he elected to continue the takeoff rather then try and stop the airplane. He reported that after liftoff the stall horn sounded and he had no elevator control. He reported the airplane stalled, hit the water, and flipped over.

The pilot was interviewed on August 3, 1998. During that interview the pilot reported he was looking for 105 to 110 knots to rotate. He also stated that when he felt the deceleration he applied heavy, slow braking and the airspeed was at 80 knots when he noticed it. He stated he did not pull the throttles back when he applied the brakes.

One of the passengers stated that during the takeoff roll everything seemed to be normal then

suddenly the airplane "...seemed to lose power... ." She continued to report, "An instant later we had power and we were moving fast again. Next, the nose lifted up as it does for takeoff and then an instant later we flipped or rolled... ."

The other passenger stated that everything seemed normal during the takeoff until they were about 3/4 the way down the runway at which time he felt a "very marked deceleration" of the airplane. He stated the airplane decelerated, then accelerated again very quickly. He did not recall if there was a change in engine noise, but was certain the engines did not stop. He stated the deceleration felt more like someone putting on the brakes rather then the engines losing power. He stated the nose of the airplane was up when they were initially over the water. The tail of the airplane contacted the water first followed by a "violent" impact when the nose contacted the water.

The accident was witnessed by several people. Several of the witnesses reported seeing the airplane traveling at a high rate of speed down the runway. A couple of them reported hearing the engine(s) "rev" up and reported seeing a puff of dust/smoke or sparks coming from the tail of the airplane as it was near the end of the runway.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with an instrument rating. His private pilot certificate was issued on August 25, 1996, and the instrument rating was added to that certificate on January 14, 1997. The pilot reported that he kept his pilot certificates along with his logbook in a satchel inside the airplane. Neither the satchel, certificates, or the logbooks were located after the accident. On his Airman Certificate and/or Rating Application for his instrument checkride the pilot reported he had a total flight time of 177.6 hours of which 88.7 hours were pilot-in-command time. On the NTSB Form 6120.1/2 the pilot reported having a total flight time of 1,600 hours, of which 1,450 hours were as pilot-in-command. In addition, he reported having 500 hours total flight time in Cessna 340 airplanes of which 400 hours was pilot-in-command.

The pilot stated that he had received a multi-engine rating in March or April of 1997. No record(s) of the pilot having received a multi-engine rating were located. The pilot reported he received the majority of his multi-engine training from a flight instructor in Ohio. When this flight instructor was contacted he stated that he had not given the accident pilot multi-engine training.

The pilot held a first class medical certificate issued July 28, 1998. The certificate contained the limitation "Holder shall wear corrective lenses."

AIRCRAFT INFORMATION

N5340F, a Cessna 340A, s/n 340A0667, was manufactured in 1979. The airplane was equipped with two Teledyne Continental TSIO-520-NB engines. The last annual inspection on the airplane was conducted on March 10, 1998, at a total airframe time of 2972.0 hours and a hobbs time of 221.7 hours. Total hobbs time at the time of the accident was 287.9 hours. The airplane had additional routine maintenance and avionics work performed on it since the annual inspection. The airplane was equipped with MICRO Vortex Generators.

AIRPORT INFORMATION

Runway 18 at Meigs Field was in use at the time of the accident. The runway is 3,899'x 150' with a 549' displaced threshold. There is a 50' paved overrun area followed by an additional

37' rock covered area at the end of runway 18 prior to the terrain drop off to the Lake Michigan. Hours of operation at the airport are from 0600 to 2200 daily.

On the morning after the accident two gulls and one kestral were found dead on the runway. All three birds were found aligned approximately 40' west of the runway centerline along the first half of the runway. The airport is equipped with a bird control cannon which is timed to activate every 20 minutes. According to airport personnel the cannon was operating on the night of the accident. There were no bird strikes reported to the Meigs Air Traffic Control Tower on the day of the accident. Neither the pilot or passengers on N5340F reported hearing a bird strike on the airplane. There was no physical evidence of a bird strike on the airplane.

WRECKAGE AND IMPACT INFORMATION

The airplane was located inverted in 20' deep water at the bottom of Lake Michigan approximately 250' from land. The position of the airplane was slightly right of the extended centerline of runway 18. The Chicago Fire/Police Department recovered the right engine upper cowling and the nose cone which were found floating in Lake Michigan on the night of the accident. The remainder of the wreckage was recovered on August 2, 1998. Chicago Police Department divers placed straps around the airplane which was then lifted out of the water using a crane located on a barge.

The nose of the airplane up to the forward bulkhead was crushed upward and to the right. The nose gear was still attached, but was bent and completely out of the wheel well.

Both wings were intact with relatively little damage. The flaps on both wings were in the retracted position. Control continuity was established from the cockpit to the ailerons, rudder, and elevator surfaces. Fuel samples were taken from both main fuel tanks and from both auxiliary fuel tanks. All the samples had the color and odor of 100LL aviation fuel. The locker tanks were empty. The fuel selector valve strainers in both the left and right wings were removed and found to be clean. The tip of the right wing main fuel tank (located on the tip of the wing) had separated from the airplane and fuel was leaking out. The rear portion of the left wing main fuel tank was crushed; however, the fuel tank was not compromised. Both landing lights were in the extended position. The pitot tube on the left wing was broken off and missing.

The right main landing gear was collapsed on top of the inner gear door which was closed. The left main landing gear was in the extended position. Both brakes were rusted. Other then the rust the brakes appeared normal in color. Brake dust was present on both the left and right brakes. Both the left and right brake discs contained scratch marks with the left brake containing a pronounced groove. Both the left and right gear brakes functioned when pressure was applied to the rudder pedals. All three tires appeared in good condition.

The aft fuselage behind the cabin bulkhead was crushed upward. Both the left and right sides of the aft fuselage were buckled inward. The belly of the airplane and the tail fin did not show evidence of scraping. The elevator and rudder were not damaged during the accident sequence. Damage to the top of the rudder and the left elevator occurred when the airplane contacted the barge during the recovery process. The emergency exit door was off and found inside the airplane. The main cabin entry door had been opened by police divers.

Both engines remained intact and attached to the airplane. The cowl flaps on the right engine were open. The cowl flaps on the left engine were in the closed position. Both the left and right engine propeller blades were found in low pitch. The right engine propeller blades were bent

slightly aft. The sides of the right propeller spinner were crushed. The spark plugs from both engines were removed and showed normal wear. The plugs were not carbon or lead fouled. Fuel was present in the lines up to the fuel pumps. Approximately three gallons of oil were drained from each engine as they were removed from the airplane.

MEDICAL AND PATHOLOGICAL

The pilot and passengers reported that during their dinner in Chicago they shared a bottle of wine between four people. The pilot voluntarily submitted a blood sample for a blood alcohol analysis after the accident. The test was conducted by the Northwestern Memorial Hospital Pathology Laboratory. The results of the test were negative.

The pilot and two passengers were treated and release from a local hospital. An autopsy on the deceased passenger was performed on August 2, 1998, by the Cook County Medical Examiner's Office. The autopsy report stated, "...died as a result of drowning... ."

SURVIVAL FACTORS

The pilot reported that he and the deceased passenger who was in the right front seat had their shoulder harnesses and seat belts on. He stated he told the passengers in the back of the airplane to put their belts on. One of the passengers in the back seat stated that they fastened their seat belts. There were no shoulder harnesses installed in the four back seats.

The pilot reported that he and the passengers were alright and talking to each other after the airplane impacted the water. He reported everyone unbuckled their own seatbelts at which time they dropped to the ceiling because the airplane was inverted. He stated he told them they had to find the door and line up so they could get out. The pilot reported he could hear water coming into the airplane, but he didn't know where it was coming from nor was he wet. He reported that his wife was sitting next to the main entry door and he recalled her saying she located the door at which time she "..popped the latch." He reported his wife was unable to open the door so the rear right seat passenger opened it and water rushed into the airplane. He stated that this passenger went out the door as it opened. (It was the emergency exit door which was opened not the main cabin door.) The pilot continued to report that he told the front right seat passenger to go out next, but his wife was closer to the door so she exited next. He reported that the airplane was filling with water and he kept telling the remaining passenger to go out the door, but she wouldn't move so he exited. The pilot reported he was inside the airplane for 5 minutes and it remained above the water for 12 minutes following the accident. He reported that search and rescue personnel did not arrive at the location until the airplane was under water and the search and rescue personnel did not follow the directions from the "boat tender" who tried to tell them the location of the airplane.

The pilot's wife who was in the left rear seat reported that after the airplane contacted the water the pilot told everyone to stay calm, unbuckle their seatbelts, and find the door. She reported they all moved together to the rear of the airplane. She reported she located the door, but was unable to open it against the water so the right rear seat passenger opened the door. She reported he went out of the airplane as the door was opened and she followed him out. She reported the pilot then surfaced and they started looking for the remaining passenger. She reported that she was in the water for 15 minutes prior to being picked up by a boat.

The right rear seat passenger reported that he unbuckled his heat belt after the airplane contacted the water. He said it seemed to him as if water was 1/2 way up the windows on the inside of the airplane by this time. He recalled the left rear seat passenger pulling on a window

and not being able to open it. He stated the only thing he remembers the pilot saying after the impact was "You've got to get that door open." He said he then began pulling on the window, but it felt as if something was blocking it. He said he put his back against something solid and pushed what he believes to have been a seat with his legs. He stated the seat moved and the window opened at which time the airplane filled rapidly with water. He stated that he had to go under water to get out of the window. He stated that he did not recall seeing his wife (the deceased front right seat passenger) after the impact. After reaching the surface he stated he dove back under the water twice in an attempt to locate his wife to no avail. He reported that a boat arrived and threw life vests into the water for them. He said he wanted to stay in the water so rescue personnel could identify the location of the airplane, but with a helicopter overhead the water became very rough at which time a boat came and picked him up.

The Burnham Harbor Tender was at the south end of Burnham Harbor when he witnessed N5340F during the takeoff and saw it disappear off the end of the runway. He stated he dropped his passengers off at the nearest dock and several other people jumped on board. He reported he arrived at the accident site approximately 1 1/2 minutes after the accident. He reported he kept attempting to contact the police boat over the radio and he assumed they were probably up by Navy Pier. He said the Fire Department used lights on the airport to light the area and the tail of the airplane was still above water. He stated he saw three people in the water and he threw life vests out to them. They were yelling that there was still another person in the airplane. He reported he eventually got the people out of the water as the helicopter was dropping the diver(s) in. He said the airplane was totally submerged by this time. He reported the divers had a hard time locating the airplane because the noise from the helicopter made it difficult for them to hear directions. He stated that one diver ran out of air fairly quickly so he picked him up in his boat. He estimated the police boat arrived on scene approximately 10 minutes after the accident.

According to the Chicago Police Department the Marine Unit boat was located north of the airport at Navy Pier when they received the call regarding the accident. The passenger remaining in the airplane was removed by a Chicago Police Department Diver. The diver stated he opened the main entry door and that the passenger was found floating in the cabin area of the airplane. Attempts to resuscitate the passenger were unsuccessful.

TESTS AND RESEARCH

Both Continental TSIO-520-NB engines and their respective turbochargers were removed from the airplane and shipped to Teledyne Continental Motors, Mobile, Alabama, where they were placed on a test stand under the supervision of the NTSB. When tested, both engines operated and produced power within the manufacturers specifications. See attached Teledyne Continental Motors report for details.

N5340F was refueled with 57 gallons of 100LL at Meigs Field. Fuel samples taken from the airplane were the color and smell of 100LL. Fuel samples were removed from both the truck which was used to refuel N5340F and from the fuel supply used to refuel the truck. Both samples were tested by Intertek Testing Services, Houston, Texas. The fuel was tested within specifications. A copy of the test results are attached to this report.

The pilot stated that he used 32" of manifold pressure for takeoff. When asked why he used this power setting, he reported he was told that you didn't need to use full power and the only thing using full power did was add extra wear and tear on the engines. The Cessna 340A Pilot's

Operating Handbook (POH) states the engines are rated at 310 horsepower at 2700rpm and 38" of manifold pressure. According to a Teledyne Continental Motors representative by using 32" of manifold pressure the engine power is reduced to 260 horsepower. All takeoff distance charts in the Cessna 340A POH are based on 2700rpm and 38" manifold pressure. The airplane was placarded that full takeoff power was 37.3" of manifold pressure.

On September 21, 1998, another Cessna 340A, N4833A, departed DuPage Airport, West Chicago, Illinois, using 32" manifold pressure. The outside air temperature was 66 degrees Fahrenheit, the airplane was equipped with vortex generators, two people were on board and the airplane contained approximately 20 gallons less fuel then N5340F at the time of the accident. The pilot of N4833A reported that he applied power to 32" manifold pressure prior to releasing the brakes for takeoff. He stated he began lifting the nose off the runway at 95 knots and fully rotated at 100 knots. The runway distance used to liftoff was approximately 3,268'.

The Emergency Procedures section in the Cessna 340A POH states:

ENGINE FAILURE DURING TAKEOFF (Speed Below 91 KIAS Or Gear Down) 1. Throttles - CLOSE IMMEDIATELY 2. Brake or Land and Brake - AS REQUIRED

ADDITIONAL INFORMATION

Parties to the investigation were the Federal Aviation Administration, West Chicago, Illinois; Cessna Aircraft Company, Wichita, Kansas, and Teledyne Continental Motors, Mobile, Alabama.

Pilot Information

Certificate:	Private	**Age:**	30, Male
Airplane Rating(s):	Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	07/28/1998
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	1600 hours (Total, all aircraft), 500 hours (Total, this make and model), 1450 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N5340F
Model/Series:	340A 340A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	340A0667
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	03/10/1998, Annual	**Certified Max Gross Wt.:**	6290 lbs
Time Since Last Inspection:	66 Hours	**Engines:**	2 Reciprocating
Airframe Total Time:	3036 Hours	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520
Registered Owner:	KEA TECHNOLOGIES, INC.	**Rated Power:**	310 hp
Operator:	KENNETH H. ASHER	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	CGX, 593 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	2145 CDT	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Scattered / 8000 ft agl	**Visibility**	15 Miles
Lowest Ceiling:	None / 0 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	23°C / 19°C
Precipitation and Obscuration:			
Departure Point:	(CGX)	**Type of Flight Plan Filed:**	None
Destination:	LOUISVILLE, KY (LOU)	**Type of Clearance:**	VFR
Departure Time:	0000	**Type of Airspace:**	Class B

Airport Information

Airport:	MERRILL C. MEIGS FIELD (CGX)	**Runway Surface Type:**	Macadam
Airport Elevation:	593 ft	**Runway Surface Condition:**	Dry
Runway Used:	18	**IFR Approach:**	
Runway Length/Width:	3899 ft / 150 ft	**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal, 2 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 3 Minor	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	PAMELA S SULLIVAN	**Report Date:**	03/31/2000
Additional Participating Persons:	JERRY WYATT; W. CHICAGO, IL CHARLES HAMILTON; W. CHICAGO, IL GEORGE HOLLINGSWORTH; RESTON, VA SETH D BUTTNER; WICHITA, KS		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		