



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	N. Fort Myers, FL	<b>Accident Number:</b>	MIA03FA135
<b>Date &amp; Time:</b>	06/26/2003, 1251 EDT	<b>Registration:</b>	N749AA
<b>Aircraft:</b>	Cessna 414	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	2 Fatal, 1 Serious, 1 Minor

**Flight Conducted Under:** Part 91: General Aviation - Personal

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## Analysis

The pilot reported visually checking the main fuel tanks during his preflight inspection of the airplane and later reported there was enough fuel for the intended flight which would be less than 1 hour, plus a 45-minute reserve amount of fuel. He estimated the fuel level in the main fuel tanks was 2-3 inches from the top. He also reported that before the accident flight he had never flown the accident make and model airplane, and that he had not had any flight training in the airplane. The passengers were boarded, the flight departed and climbed to between 4,500 and 6,500 feet msl. He leaned the mixture during cruise, and the flight continued. He began descending when the flight was 12 miles from the destination airport, and he performed the pre landing checks when the flight was 3 miles from the destination airport. The flight entered left downwind where he lowered the landing gear and turned on the fuel pumps. When abeam the landing point he reduced power, lowered the flaps 10 degrees, and turned onto base leg. During the base leg while rolling out of the turn and flying at 600 feet, "the right engine suddenly came to a stop...." He banked to the left to maintain zero sideslip, pushed the mixture, propeller, and throttle controls full forward, and identified the right engine had failed. He reportedly pulled the right propeller control to the feather position but during the postaccident investigation, the right propeller blades were not in the feather position and there was no evidence of preimpact failure or malfunction of the propeller. The pilot further reported that while pulling the right propeller control to the feather position, the airplane, "began to yaw right and simultaneously bank right...." He moved the left throttle control to idle, and they were on the ground in a span of 6 seconds from the time the right engine quit. No fuel leakage was noted at the scene, and no fuel contamination was noted in a nearby pond. Additionally, only residual fuel was noted in the fuel lines in each engine compartment. A total of 4.0 and 1.5 gallons of fuel were drained from the left and right auxiliary fuel tanks, respectively. No evidence of preimpact flight control failure or malfunction was noted. Neither propeller was at or near the feather range at the time of impact. Both engines were removed from the airplane, placed on a test stand with a "club" propeller, and both engines were noted to operate normally during the engine run. Examination of the right seat in the third row of the airplane revealed the seat frame was bent down on the left side, and all seat feet were in position but distorted; no fracture of the seat feet were noted. Examination of the seat of the

passenger who sustained minor injuries (left seat in the third row) revealed the seatpan was compressed down, and the lapbelt was unbuckled. The inboard arm rest was bent inward, and the outboard arm rest was bent outward. The seat frame indicated displacement to the left. The seat back was twisted counter clockwise, and the left forward seat foot was in place. The seat and attach structure was certificated for a maximum forward g loading of 9 g's, and a maximum sideward g loading of 1.5 g's. This does not include a 1.33 margin of safety factor. The seat and attach structure was tested to ultimate loads in a combined forward, sideward, and upward directions in accordance with CAR 3.390-2. The same loads were also applied in a downward direction by itself. The empennage was separated just aft of the aft pressure bulkhead but remained secured by flight control cables. According to personnel from the airplane manufacturer, the tested load (150 percent limit) for the empennage in negative shear translates to 14.0 g loading. Based on Cessna Engineering rough calculations, they believe the empennage is capable of sustaining an additional 30 percent beyond what it was tested to, or an estimated 18.2 g's in negative shear loading.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot to maintain airspeed (Vs) following a total loss of engine power from the right engine due to fuel starvation, resulting in an inadvertent stall, uncontrolled descent, and in-flight collision with trees and terrain. Factors in the accident was the failure pilot to feather the right propeller following the total loss of engine power, and his lack of total experience in the accident make/model of aircraft.

## Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL  
Phase of Operation: APPROACH - VFR PATTERN - BASE TURN

### Findings

1. 1 ENGINE
  2. AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
  3. FLUID,FUEL - STARVATION
  4. (F) EMERGENCY PROCEDURE - NOT PERFORMED - PILOT IN COMMAND
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Occurrence #2: LOSS OF CONTROL - IN FLIGHT  
Phase of Operation: MANEUVERING

### Findings

5. (C) AIRSPEED(VS) - NOT MAINTAINED - PILOT IN COMMAND
  6. STALL - INADVERTENT - PILOT IN COMMAND
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Occurrence #3: IN FLIGHT COLLISION WITH OBJECT  
Phase of Operation: DESCENT - UNCONTROLLED

### Findings

7. OBJECT - TREE(S)
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Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER  
Phase of Operation: DESCENT - UNCONTROLLED

### Findings

8. TERRAIN CONDITION - GROUND

## Factual Information

### HISTORY OF FLIGHT

On June 26, 2003, about 1251 eastern daylight time, a Cessna 414, N749AA, registered to Osprey Air Services, Inc., experienced an in-flight loss of control and collided with trees then the ground near North Fort Myers, Florida. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 CFR Part 91 personal flight from Palm Beach County Park Airport (KLNA), West Palm Beach, Florida, to Pine Shadows Airpark, Fort Myers, Florida. The airplane was substantially damaged and the commercial-rated pilot sustained serious injuries. A pilot-rated passenger seated in the copilot's seat and another passenger in the cabin were fatally injured. The remaining passenger sustained minor injuries. The flight originated about 1213, from Palm Beach County Park Airport.

According to an NTSB prepared transcription of communications from an uncertified copy of the voice tape from Fort Myers Air Traffic Control Tower, at an undetermined time, the pilot contacted the facility and was advised by the controller to remain clear of "Class Charlie Airspace." A position relief briefing was conducted and the controller established contact with the pilot who advised that the flight was over Lake Okeechobee inbound to "Pine Shadows Airpark", and requesting VFR flight following. The controller provided a discrete transponder code and altimeter setting. The pilot repeated the altimeter setting and advised the controller that he would report when the destination airport was in sight. The flight was radar identified, and the flight continued. At an undetermined time the pilot advised the controller that the destination airport was in sight; the controller advised the pilot that radar service was terminated and frequency change was approved. The pilot acknowledged that transmission. There were no further recorded transmissions from the pilot.

The pilot later stated in writing that he performed a "thorough" preflight inspection of the airplane using a checklist. He "examined the fuel and calculated that we would have at least 45 minutes of reserve fuel after we landed", and he checked both main fuel tanks. He reported twice checking the fuel level in both main fuel tanks and reported the level in both tanks was 2-3 inches from the top. He estimated the flight duration to be less than 1 hour, and he planned on fueling the airplane at the destination airport, so he did not fill the auxiliary or engine nacelle tanks. The passengers were boarded, and both engines were started; the right engine took a little more time to start than the left. He "checked that all the pressures and temperatures were within proper limits and the magnetos on each engine were operating properly."

The pilot stated that the flight departed to the east from KLNA, and after takeoff initially climbed to 2,500 feet mean sea level (msl), then climbed to between 4,500 and 6,500 feet msl. During cruise flight he leaned the fuel/air ratio for each engine and completed the cruise checklist items. The flight continued and he began to descend when the destination airport was in sight, which was when the flight was 12 miles away. When the flight was 3 miles from the destination airport he performed the pre landing checks and noticed, "the fuel gauges indicated 15 gallons/90 lbs. of fuel remaining in the left main tank and 18 gallons/108 lbs. in the right main fuel tank." Less than 2 minutes later he entered left downwind for landing to the east at the destination airport and went through the "pre landing GUMPS checks." He lowered the landing gear, turned on the fuel pumps for both engines, enriched the fuel/air ratio, verified that the gear was down and locked, and that everyone had their seatbelts on.

While flying at an airspeed 25 knots above the manufacturers recommended final approach speed and when abeam the touchdown point, he reduced power and lowered the flaps 10 degrees. He turned onto base leg, and while rolling out of the turn he stated, "the right engine suddenly came to a stop, and I banked to the left maintaining a zero sideslip configuration and directional control." He pushed the mixture, propeller, and throttle controls forward in that order, and identified that the right engine had failed. He pulled the right propeller control to the feather position, and while doing so the airplane, "began to yaw right and simultaneously bank right. I reached for the throttle on the left engine and pulled it [to] idle, attempted to maintain control of the aircraft and accomplish an emergency landing in the safest area I could find." He also stated that the right engine quit while flying at 600 feet and less than 6 seconds later, "we were on the ground."

A witnesses located approximately 3/4 nautical mile northeast of the crash site reported seeing the airplane banking to the left, which increased to an inverted position as well as being in a nose low attitude, nearly vertical. The airplane was then observed to roll to the right while remaining in the nose low attitude. The witness then lost sight of the airplane due to obstructions. Another witness located approximately .15 nautical mile southeast of the accident site reported seeing the airplane flying westbound with decreasing engine sound; no smoke or fire was observed trailing the airplane. The airplane was observed to spin to the right 4 times in a tight turn; the witness then lost sight due to obstructions.

The passenger who sustained minor injuries reported to sheriff's office personnel that prior to the accident, the landing gear was extended and he heard a buzzing sound immediately before the airplane entered a spin. He was not sure how many times the airplane spun.

#### PERSONNEL INFORMATION

The pilot (left seat occupant) is the holder of a commercial pilot certificate with ratings airplane single engine land, airplane multi-engine land, and instrument airplane. He was also the holder of a certified flight instructor certificate with airplane single engine, and instrument airplane ratings. The instrument rating was added on May 30, 2003, which was the date of his last flight review or equivalent required by 14 CFR Part 61.56. He was issued a first class medical certificate on December 6, 2002, with no limitations.

A review of the pilot prepared NTSB "Pilot/Operator Aircraft Accident Report" form revealed he listed a total time of 972 hours, with 0 hours in make and model and 38 hours total multi-engine time. In the last 90 days he listed a total time of 266 hours, with 3 hours in multi-engine airplanes and the remainder in single engine airplanes. During the last 30 days, he listed a total time of 90 hours, and during the last 24 hours he listed a total time of 6 hours, with 3 of the 6 hours in multi-engine airplanes.

A review of the pilots' pilot logbook revealed he was signed off by a certified flight instructor to operate a pressurized airplane capable of operating at high altitudes in accordance with 14 CFR Part 61.31(g), on May 31, 2003. The flight was conducted in a Beech 200 airplane; the flight duration was recorded to be 1.3 hours.

According to FAA records, the right seat occupant was the holder of a private pilot certificate with airplane single engine land rating. He was issued a third class medical certificate on March 13, 2003, with the limitation that he wear corrective lenses and possess glasses for near/intermediate vision. He listed a total time of 400 hours on the application for the last medical certificate.

## AIRCRAFT INFORMATION

The airplane was manufactured by Cessna Aircraft Company in 1970, as model 414, and designated serial number 414-0049. It was type certificated in the normal category in accordance with Civil Aeronautics Regulation (CAR) 3, and equipped with two Teledyne Continental Motors TSIO-520-J engines rated at 310 horsepower. The airplane was also equipped with two McCauley, constant speed, manual feathering, 3AF32C93-R/82NC-5.5 propellers.

Review of the airplane maintenance records revealed the airplane was last inspected in accordance with a 100-Hour/Annual inspection that was signed off as being completed on February 11, 2003. The airplane total time at that time was recorded to be 1,710.1 hours.

## METEOROLOGICAL INFORMATION

A METAR weather observation taken at 1253, or approximately 2 minutes after the accident at the Page Field Airport, Fort Myers, Florida, indicates clear skies existed, and the wind was 070 degrees at 7 knots, variable from 030 to 110 degrees. The visibility was 10 statute miles, the temperature and dew point were 30 and 22 degrees Celsius, respectively, and the altimeter setting was 30.05 inHg.

## COMMUNICATIONS

The pilot was last in contact with Fort Myers Approach Control. There were no reported communication difficulties.

## WRECKAGE AND IMPACT INFORMATION

Examination of the accident site revealed the airplane came to rest behind a mobile home located in a residential area; no postcrash fire was noted. The crash site was located at 26 degrees 44.689 minutes North latitude and 081 degrees 56.092 minutes West longitude, or approximately 294 degrees and 2.14 nautical miles from the destination airport. The airplane was resting against a tree. Several pine trees were in close proximity to the wreckage.

Examination of several of the trees revealed evidence of multiple contacts approximately 46 feet above ground level. Two slashes associated with the right propeller were noted in one of the tree trunks. The nose section of the airplane forward of the front pressure bulkhead had a section of tree embedded in it. A section of tree trunk was embedded into the co-pilots seat area. Upon NTSB arrival, six seats and the seatback of the pilot's seat were located outside of the airplane. The seats were retained for further examination.

Examination of the wreckage revealed the airplane was upright on a magnetic heading of 218 degrees. All components necessary to sustain flight remained attached to the airplane or were in close proximity to the main wreckage. The empennage was separated at the aft pressure bulkhead but remained connected by flight control cables. Both wings remained secured to the fuselage, but approximately 6 feet of the right wing was separated by impact forces. The separated section of the right wing was found in close proximity to the main wreckage. The vertical stabilizer remained attached to the empennage and the rudder remained attached to the vertical stabilizer. The left horizontal stabilizer remained secured to the empennage and the left elevator remained secured to the left horizontal stabilizer. The right horizontal stabilizer remained secured to the empennage and a 3 foot 6 inch length of right elevator remained attached to the right horizontal stabilizer. The separated section of the right elevator was found in close proximity to the main wreckage.

No browning of grass due to fuel leakage was noted beneath either wing. The left main and left auxiliary fuel tanks were breached. The left main fuel tank bulkhead baffle exhibited a slight forward bulge. The right main fuel tank was separated. No fuel was found in either the breached left main fuel tank or in the separated right main fuel tank. Approximately 4.0 gallons and 1.5 gallons of 100 low-lead (100 LL) fuel were drained from the left auxiliary and right auxiliary fuel tanks, respectively. The left locker tank was drained and found to contain approximately 2 ounces of water admixed with fuel, no fuel was found in the right locker tank. No fuel staining was noted on the wings aft of any of the six fuel tank filler openings. Both engines remained attached, and the left propeller remained attached to the engine. The right propeller was separated from the engine but found in close proximity to the engine.

Further examination of the wreckage revealed rudder, elevator, and left aileron flight control continuity was confirmed. The right aileron control cable was fractured in the co-pilots seat area. No evidence of preimpact damage was noted to the fractured right aileron control cable. The flaps were extended approximately 10 degrees, and the aileron trim tab actuator was positioned greater than maximum limits. The rudder trim tab actuator was positioned to approximately 7 degrees trailing edge tab left, while the elevator trim tab actuator was positioned approximately 6 degrees trailing edge down. The landing gear was extended based on examination of the landing gear actuator.

Examination of the cockpit revealed both control yokes were in position. The readings from the dual tachometer were left (2,500 rpm) and right (800 rpm). Both fuel flow readings, both oil temperature readings, both exhaust gas temperature readings, the left cylinder head temperature reading, the right fuel quantity, and right oil pressure readings were off scale low. The right cylinder head temperature reading was 200 degrees Fahrenheit. The left fuel quantity indicated 70 pounds. The left oil pressure reading was at the lower red line. The throttle quadrant was displaced to the left. The left and right throttle controls were full forward and midrange, respectively. The left and right propeller controls were also full forward and midrange, respectively. The left and right mixture controls were found 1/2 inch and 1.5 inches aft of full forward, respectively. The throttle friction was loose. The aileron and rudder trim indicators were found positioned near full right and neutral, respectively. The alternate engine air controls were each found in the off position. The left fuel selector was found positioned to the right main position, while the right fuel selector position was not determined. Impact damage to the left fuel transfer switch precluded determination of position, while the right fuel transfer switch was in the off position. The master switch, and left and right alternator switches were found in the off position. The left and right magneto switches of both engines were each in the on position, while both auxiliary fuel pump switches were in the low position. Fuel quantity indicating system components were retained for further examination.

Further examination of the cockpit revealed the pilots seat base remained in the airplane. The floor adjacent to the pilots seat was crushed up. The pilot's shoulder harness remained secured to the lapbelt which was not buckled. The co-pilots seat was detached, and the seat pedestal was destroyed. The copilot's shoulder harness was cut. The forward portion of the cabin roof was crushed down most prominently in the copilots seat area. Blood was noted on the interior fabric in the cabin between the two seats in the second row. The annunciator panel, left and right auxiliary tank indicator light bulbs, and the Shadin Digiflo instrument were retained for further examination.

Examination of the fuel system components of the airplane revealed the left and right fuel

selector valves located near each engine were each in the "off" position. Approximately 2 ounces of 100LL fuel were drained from the left fuel strainer; the screen was clean. The right fuel strainer screen exhibited very slight contamination; no fuel was noted at the strainer inlet fitting. Residual fuel was noted in the in-line fuel pump outlet for the left auxiliary fuel tank. No fuel was noted at the outlet of the in-line fuel pump outlet for the right auxiliary fuel tank, while residual fuel was noted at the inlet of the in-line fuel pump for the right auxiliary fuel tank. No fuel was noted at the inlet or outlet of the left auxiliary fuel pump. A drop of fuel was noted at the inlet and outlet fittings of the right auxiliary fuel pump. Residual fuel was noted in the crossfeed line at the left wing root, while no fuel was noted in the crossfeed line at the right wing root.

The left engine was examined following recovery of the airplane to determine fuel remaining in the flexible fuel lines in the engine compartment. Examination of the flexible fuel lines revealed approximately 1/2 ounce of fuel was drained from the fuel line from the mechanical fuel pump to the fuel metering unit. Only 2 drops of fuel were found in the fuel line from the fuel metering unit to the fuel manifold, and also at the fuel manifold inlet. The fuel flow transducer was retained for further examination. The engine was removed from the airplane, placed on a test stand, and a "test club" propeller was installed. The turbocharger was removed for the attempted engine run. Examination of the turbocharger revealed both wheels rotated freely with no blade bending or scoring of the housing noted. Impact damaged components consisting of the No. 6 cylinder rocker boss cover and exhaust pipe, oil sump, and intake manifold crossover tube were replaced. The engine driven fuel pump drive coupling was inspected before the engine run; the coupling was intact. The propeller governor was removed for the engine run and a cover plate was installed at the governor drive pad. The engine was started and operated for approximately 2 minutes. During that time the engine was noted to run rough when operating only on the right magneto, and an oil leak was noted at the propeller governor drive pad. The oil leak was corrected and the engine was restarted and operated for approximately 5 minutes. During that time the engine was again noted to run rough when operating only on the right magneto. The engine was secured and inspected; damage to the No. 2 cylinder top spark plug lead was noted. The damaged spark plug lead was repaired, and the engine was started and operated for approximately 8 minutes. During that time the maximum rpm attained was 2,000 at full throttle (full throttle specification with test club propeller is 2,000 to 2,100), the oil pressure was 45 psi, and each magneto drop was less than 100 rpm, with a difference of 15 rpm between the two during the magneto check.

The right engine was examined following recovery of the airplane to determine fuel remaining in the flexible fuel lines in the engine compartment. Examination of the flexible fuel lines revealed only drops of fuel were found in the fuel line from the mechanical fuel pump to the fuel metering unit. Approximately 1/2 ounce of fuel was found at the fuel manifold inlet. The fuel flow transducer was retained for further examination. The engine was removed from the airplane, placed on a test stand, and a "test club" propeller was installed. The turbocharger was removed for the attempted engine run. Examination of the turbocharger revealed both wheels rotated freely with no blade bending or scoring of the housing noted. A temporary repair was made to the impact damaged No. 6 cylinder rocker cover. The engine was started and operated for approximately 6 minutes. During that time the maximum rpm attained was 2,000 at full throttle (full throttle specification with test club propeller is 2,000 to 2,100 rpm), the oil pressure was 60 psi, and each magneto drop was 100 rpm with no differential between the two. Examination of the left and right propellers was performed at the manufacturer's facility with



FAA oversight. The examination of both propellers revealed there was no indication of preimpact failure or malfunction, neither propeller was at or near the feather position at impact, and the damage to both propellers was nearly symmetrical. Additionally, both propellers were operating at or near the low pitch range.

#### MEDICAL AND PATHOLOGICAL INFORMATION

Postmortem examinations of the passengers were performed by the District 21 Medical Examiner's Office. The cause of death for both was listed as multiple blunt force trauma. The autopsy report for the passenger seated in the right seat of the third row indicates in part, "A 10 X 4 focus of horizontally oriented patterned abrasion is noted on the left anterior hip region with a continuing area of a similar linear pattern measuring 6 X 4 cm more in the midline."

The FAA Toxicology and Accident Research Laboratory located in Oklahoma City, Oklahoma, performed toxicological analysis of specimens of the pilot-rated passenger seated in the right front seat. The results of analysis were negative for carbon monoxide, cyanide, ethanol, and tested drugs.

#### TESTS AND RESEARCH

Bench testing of both propeller governors was performed with NTSB oversight. The left governor was placed on the test bench as removed from the engine and during the high rpm test, was found to operate at 2,640 rpm (specification is 2,700). The dump pressure test occurred at 1,840 rpm (specification is 1,850 rpm plus or minus 25 rpm). The relief valve pressure tested at 310 psi (specification is 270 psi plus or minus 10 psi). The governor pumped 6 quarts-per-minute, which was considered normal. Impact damage to the right governor precluded bench testing. Examination of the right governor revealed the control shaft and lift rod were impact separated. The speeder spring appeared normal, and the lift rod was bent. The actuator was shifted due to impact damage. The pushrod, pilot valve, main bearing and race all appeared normal. Normal wear was noted on the flyweight pins and oil pressure relief valve; the flyweight assembly appeared normal. The drive and idler gear appeared normal, and fresh oil was inside the governor.

Bench testing of the Shadin Company, Inc., left and right fuel flow transducer, and "Digiflo" indicator was performed at the manufacturers facility with FAA oversight. The examination revealed both transducers flowed within serviceable tolerance, and the numbers displayed on the indicator reflected a full fuel load of 120 gallons, with minus 265 gallons of fuel remaining.

The NTSB Materials Laboratory located in Washington, D.C., performed examination of the filaments of the light bulbs in the annunciator panel, and of the filaments of the light bulbs for the left and right auxiliary fuel tank indicator lights. The filaments of the left fuel transfer light bulbs from the annunciator panel exhibited distortion of the overall shape of the filament, while one of the filaments of the right fuel transfer light bulb was lost during removal, the other bulb filament exhibited distortion of the overall shape of the filament. The filaments of the "R ALT OUT" bulbs from the annunciator panel exhibited substantially more coil elongation and kinking than any of the filaments of the other bulbs in the annunciator panel. Examination of the filaments of the light bulbs for the left and right auxiliary fuel tank indicator lights revealed the filament for the right auxiliary fuel tank indicator light was slightly distorted and stretched.

The pilot reported on the NTSB "Pilot/Operator Aircraft Accident Report" form that the accident flight was the only time he had ever flown the accident make and model airplane, and that he had not had any flight training in the airplane. He also stated that he had been a

passenger in the accident airplane 3 months 17 days earlier and during that flight which lasted approximately 4.5 hours, he familiarized himself with the airplane and its systems.

Postaccident, the NTSB requested testing of water samples taken from the pond that was located immediately adjacent to where the airplane came to rest to determine if there was any fuel leakage. The testing was performed by the State of Florida Department of Environmental Protection. No fuel was found in the tested water samples.

The fuel quantity indicating system is a capacitance type. The right main fuel tank transmitter was fractured and bent which precluded determination of right main fuel tank gauging system accuracy. A representative of the airplane manufacturer reported they did not have the capability of testing the individual components of the fuel quantity gauging systems; therefore, the fuel quantity indicating system components were not examined.

Based on a taped/transcribed interview of the surviving passenger performed by the local law enforcement agency, the occupants in the cabin were seated side by side in the third row. The third row consists of 2 seats that are forward facing; each end of the lapbelt connects to the seat. Based on a taped interview with a Sergeant with the Lee County Sheriff's Department, with respect to the fatally injured passenger, when the Sergeant first arrived on-scene he observed a passenger lying partially out of the "doorway on the backside of the plane. Um...I quickly checked for pulse, found no pulse, I removed a seat from the plane off his body...."

Examination of the seat of the passenger who sustained minor injuries (left seat in the third row) revealed the seatpan was compressed down, and the lapbelt was unbuckled. The inboard arm rest was bent inward, and the outboard arm rest was bent outward. The seat frame indicated displacement to the left. The seat back was twisted counter clockwise, and the left forward seat foot was in place. Examination of the seat of the fatally injured passenger (right seat in the third row) revealed the seat frame was bent down on the left side, and all seat feet were in position but distorted; no fracture of the seat feet were noted. The inboard armrest was bent up and aft, and the seatback was twisted slightly counterclockwise. Each portion of the lapbelt was not failed; the seatbelt was found unbuckled.

As previously reported in the Wreckage and Impact section of this report, the empennage was partially separated just aft of the aft pressure bulkhead. According to personnel from the airplane manufacturer, the tested load (150 percent limit) for the empennage in negative shear translates to 14.0 g loading. Based on Cessna Engineering rough calculations, they believe the empennage is capable of sustaining an additional 30 percent beyond what it was tested to, or an estimated 18.2 g's in negative shear loading.

Review of CAR 3 revealed all seats and their supporting structures shall be designed for an occupant weighing at least 170 pounds, and for maximum load factors corresponding with all specified flight and ground load conditions including the emergency landing conditions prescribed in section 3.386. Review of section 3.386 titled "Protection" revealed the ultimate accelerations to which occupants are assumed to be subjected for a "normal suffix" airplane are 3.0 g's upward, 9.0 g's forward, and 1.5 g's sideward. Regulation 3.390 (d) states, "In determining the strength of the attachment of the seat and berth to the structure, the accelerations prescribed in section 3.386 shall be multiplied by a factor of 1.33."

Cessna tested and certified all the seats in the model 414 in accordance with CAR 3.390-2. The seat and attach structure was tested to ultimate loads in a combined forward, sideward, and upward directions in accordance with CAR 3.390-2. The same loads were also applied in a

downward direction by itself.

As previously discussed in the "Wreckage and Impact" section of this report, neither propeller was at or near the feather position at the time of impact. Review of the airplane "Owner's Manual" revealed the procedures specified in the "Engine Failure During Flight" indicate:

- (1) Inoperative Engine - DETERMINE (idle engine same side as idle foot).
- (2) Fuel Flow - CHECK, if deficient, position auxiliary fuel pump switch to ON.

NOTE

If fuel selector is in AUXILIARY TANK position,  
switch to MAIN TANK and feel for detent.

- (3) Fuel Quantity - CHECK, and switch to opposite MAIN TANK if necessary.
- (4) Oil Pressure and Oil Temperature - CHECK, shutdown engine if oil pressure is low.
- (5) Magneto Switches - CHECK

If proper corrective action was taken, engine will restart. If it does not, secure as follows:

- (6) Inoperative Engine - SECURE.
  - a. Throttle - CLOSED.
  - b. Mixture - IDLE CUT-OFF.
  - c. Propeller - FEATHER.
  - d. Fuel Selector - OFF.
  - e. Auxiliary Fuel Pump - OFF.
  - f. Magneto Switches - OFF.
  - g. Alternator Switch - OFF.
  - h. Cowl Flap - CLOSED.
- (7) Operative Engine - ADJUST.
  - a. Power - AS REQUIRED.
  - b. Mixture - ADJUST for power.
  - c. Fuel Selector - MAIN TANK (feel for detent).
  - d. Auxiliary Fuel Pump - ON
  - e. Cowl Flap - AS REQUIRED
- (8) Trim Tabs - ADJUST (5 degree bank toward operative engine).
- (9) Electrical Load - DECREASE to maintain positive battery.
- (10) As soon as Practical - LAND

ADDITIONAL INFORMATION

The airplane minus the retained components was released to David E. Gourgues, insurance adjuster for CTC Services Aviation (LAD, Inc.), on January 14, 2005. During the course of the

investigation numerous retained components were released to Mr. Gourgues. The remaining NTSB retained components were shipped via FEDEX to the address specified by the attorney who represents the fatally injured passengers. The components were received on March 17, 2005.

## Pilot Information

<b>Certificate:</b>	Flight Instructor; Commercial	<b>Age:</b>	30, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Without Waivers/Limitations	<b>Last FAA Medical Exam:</b>	12/01/2002
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	05/01/2003
<b>Flight Time:</b>	972 hours (Total, all aircraft), 0 hours (Total, this make and model), 853 hours (Pilot In Command, all aircraft), 266 hours (Last 90 days, all aircraft), 90 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N749AA
<b>Model/Series:</b>	414	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	414-0049
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	8
<b>Date/Type of Last Inspection:</b>	02/01/2003, Annual	<b>Certified Max Gross Wt.:</b>	6200 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	1710.1 Hours as of last inspection	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	Installed	<b>Engine Model/Series:</b>	TSIO-520-J
<b>Registered Owner:</b>	Osprey Air Services, Inc.	<b>Rated Power:</b>	310 hp
<b>Operator:</b>	John E. Nowicki Jr.	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KFMY, 17 ft msl	Distance from Accident Site:	
Observation Time:	1253 EDT	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	7 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	70°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.05 inches Hg	Temperature/Dew Point:	30° C / 22° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	West Palm Beach, FL (KLNA)	Type of Flight Plan Filed:	None
Destination:	Fort Myers, FL (94FL)	Type of Clearance:	None
Departure Time:	1213 EDT	Type of Airspace:	

## Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	2 Fatal, 1 Minor	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal, 1 Serious, 1 Minor	Latitude, Longitude:	26.744722, -81.935000

## Administrative Information

Investigator In Charge (IIC):	Timothy W Monville	Report Date:	04/25/2006
Additional Participating Persons:	James R Herndon; FAA Flight Standards District Office; Tampa, FL Scot E Thompson; FAA Flight Standards District Office; Minneapolis, MN Stanley P Faske; FAA Flight Standards District Office; Cincinnati, OH Tommy L Moody; Cessna Aircraft Company; Wichita, KS John T Kent; Teledyne Continental Motors; Mobile, AL Rasheed Reda; Shadin Company, Inc.; St. Louis Park, MN Kris Wetherell; Teledyne Continental Motors; Mobile, AL Thomas M Knopp; McCauley Propeller Systems; Vandalia, OH		
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 <a href="mailto:pubinquiry@ntsb.gov">pubinquiry@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.ntsb.gov/pubdms/">http://dms.ntsb.gov/pubdms/</a> .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).