



# National Transportation Safety Board Aviation Accident Final Report

---

|                                |                                                 |                         |            |
|--------------------------------|-------------------------------------------------|-------------------------|------------|
| <b>Location:</b>               | EAST NAPLES, FL                                 | <b>Accident Number:</b> | MIA96FA051 |
| <b>Date &amp; Time:</b>        | 12/31/1995, 1225 EST                            | <b>Registration:</b>    | N91MJ      |
| <b>Aircraft:</b>               | Cessna 550                                      | <b>Aircraft Damage:</b> | Destroyed  |
| <b>Defining Event:</b>         |                                                 | <b>Injuries:</b>        | 2 Fatal    |
| <b>Flight Conducted Under:</b> | Part 91: General Aviation - Executive/Corporate |                         |            |

---

## Analysis

The flight was cleared for the VOR/DME approach to runway 17 at the Marco Island Airport. The CVR recorded conversation between the pilot and co-pilot reference to the approach, specifically the MDA both in mean sea level and absolute altitude for a straight-in-approach to runway 17. The flight crew announced that the flight was landing on runway 35. The flight crew did not discuss the missed approach procedure nor the circling minimums. The flight continued and the co-pilot announced that the flight was 5 miles from the airport to descend to the MDA to visually acquire the airport. While descending about 8.5 feet of the left wing of the airplane was severed by a guy wire about 587 feet above ground level from an antenna that was 3.36 nautical miles from the threshold of runway 17. The tower is listed on the approach chart that was provided to the flight crew. The airplane then rolled left wing low, recovered to wings level, then was observed to roll to the left, pitch nose down, and impacted the ground. A fireball was then observed by witnesses. The altimeters, air data computer, and pilot's airspeed indicator were last calibrated about 8 months before the accident. The co-pilot's altimeter was found set .01 high from the last known altimeter setting provided to the flight crew. The CVR did not record any conversation pertaining to failure or malfunction of either the pilot or co-pilot's HSI, the DME or Altimeters. There were no alarms from the VOR/DME monitoring equipment the day of the accident. The flight crew of another airplane executed the same approach about 30 minutes before the accident and they reported no discrepancies with the approach. The MDA for the segment of the approach between where the tower is located is no lower than 974 feet above ground level.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's disregard for the MDA for a specific segment of the VOR/DME approach which resulted in the inflight collision with a guy wire of an antenna and separation of 8.5 feet of the left wing.

## Findings

---

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings

1. OBJECT - GUY WIRE
2. (C) MINIMUM DESCENT ALTITUDE - DISREGARDED - PILOT IN COMMAND

-----

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

3. TERRAIN CONDITION - OPEN FIELD

## Factual Information

### HISTORY OF FLIGHT

On December 31, 1995, about 1225 eastern standard time, a Cessna 550, N91MJ, registered to and operated by Moran Foods, Inc., collided with a guy wire from an antenna then collided with the ground near East Naples, Florida. Instrument meteorological conditions prevailed at the time and an IFR flight plan was filed for the 14 CFR Part 91 corporate flight. The airplane was destroyed and the airline transport-rated pilot and copilot were fatally injured. The flight originated about 0824 central standard time from the St. Louis Downtown-Parks Airport, Cahokia/St. Louis, Illinois.

The flight from St. Louis to the descent while in range was uneventful. There were no reported discrepancies of altitudes or headings flown as requested by Air Traffic Control (ATC) facilities during the flight.

Readout of the aircraft cockpit voice recorder (CVR) revealed that at 1156.45, the flightcrew monitored the Naples Airport, Airport Terminal Information Service (ATIS).

At 1206.16, the copilot contacted Fort Myers Approach Control and the flightcrew was given the altimeter setting of 30.00 inHg and told to expect the VOR runway 17 approach to the Marco Island Airport. The copilot acknowledged this then stated, "one forty eights inbound, huh" and the pilot-in-command responded in the affirmative. At 1206.53, the CVR recorded the copilot to state "three fifty four on your doohickey over there." The flightcrew was later advised to descend to 7,000 and at 1209.29, the CVR recorded the copilot to state, "obviously try to land to the north if we can." The flight was later cleared to descend to 5,000 feet and to contact approach control on a different frequency. The copilot contacted the approach controller on the new frequency and at 1214.30, the controller advised the flightcrew to expect the VOR/DME approach to runway 17. The copilot acknowledged this.

At 1218.29, the copilot stated "got a capture" and at 1219.55, 5 minutes 25 seconds after the controller advised the flightcrew to expect the VOR approach, the CVR recorded the PIC to ask what the MDA for the approach was. The copilot stated "...three sixty." The copilot then stated "two thousand till established and once you pass the VOR you can come down to 1,600 maintain (to or possible for) 5 miles thence" and the PIC responded "down to three." At 1220.34, the copilot stated "after five miles come down" and the PIC stated "three sixty." The PIC then asked the copilot to contact the approach controller to inquire if the flight was cleared for the approach and the controller stated in part, "...very shortly." At 1221.41, the copilot stated "it, its more than five miles and it will be down to nine eighty."

At about 1221.51, the approach controller advised the flightcrew that the flight was 4 miles from TIOFF, maintain 1,600 until established final approach course, cleared for the VOR/DME runway 17 approach Marco Island. The copilot acknowledged the approach clearance with the approach controller and about 4 seconds later the PIC requested approach flaps. The copilot then stated "looks like we need about 10 right" followed by "one down at nine eighty" with a sound one second later similar to the altitude alert signal. At 1223.15, the flightcrew was advised that radar service was terminated and to contact to the airport advisory frequency which the copilot acknowledged. About 3 seconds later the co-pilot advised on the Marco Island Airport Common Traffic Frequency (CTAF) that the flight was "6 north inbound on the approach will be landing on runway 35. At 1223.34, the copilot stated "yeah you otta be in

good shape if you don't mind sneaking around a little bit yeah within 5 miles of the airport there you can come on down to three sixty." At 1223.57, the copilot stated "ah the airports a little bit to your left" then "about ten left looks like about one fifty five heading will take you right to it four miles out get her right down so we can see it." The copilot then stated "three miles" and 4 seconds later, a sound of impact was heard. Conversation between the flightcrew about controlling the airplane occurred and at 1224.39, the copilot stated "...gotta find somewhere to land this keep the power in" to which the PIC responded "I got it." At 1224.54, the PIC stated "one hundred thirty knots" and at 1225.04, the copilot stated "its dropping on you Hal." There was no further pertinent conversation from the flightcrew and at no time during the time recorded by the CVR did they report seeing the ground. Further review of the CVR that stopped recording at 1225.07 hours revealed that the flightcrew did not discuss the missed approach procedure, nor the MDA and visibility minimums for a circle to land approach.

Numerous witnesses on the ground near the tower reported that the top of the tower was obscured by clouds and the airplane was observed to descend below the base of the clouds then collided with a guy wire of the antenna. A section of the airplane was observed to fall to the ground and the airplane rolled to left nearly inverted then rolled wings level while descending flying in an easterly direction. Witnesses closer to the accident site observed the airplane roll to the left, pitch nose down, then impact the ground and a fireball was observed.

#### PERSONNEL INFORMATION

Both pilots were issued an Airline-Transport Pilot certificate with a type rating in Cessna 500 aircraft. The first pilot's name was listed as the pilot in the IFR flight plan. Review of his pilot logbook revealed that he had logged 11.7 hours actual instrument time with corresponding 15 instrument approaches during the preceding 6 months all in the airplane category. During the preceding 90 days he logged eight takeoffs and landings in the accident airplane and he was given a checkride in accordance with 14 CFR Part 135.297 and 135.299 on October 26, 1995. On March 2, 1994, he was also given a checkride in a Cessna 501 airplane. Additional information pertaining to the first pilot may be obtained in the NTSB Factual Report on page 3.

Review of the second pilot's logbook revealed that he had logged about 93 hours within the preceding 90 days of which about 68 hours were in the accident airplane. During that same time he logged about 17 hours actual instrument time and 17 instrument approaches. Also during that time he logged 61 hours as pilot-in-command and last attended Flight Safety on January 12-14, 1995, for recurrent Citation II flight training. Additional information pertaining to the second pilot may be found the NTSB Supplement E.

#### AIRCRAFT INFORMATION

Review of the maintenance records revealed that both altimeters, the air data computer, and the pilot's airspeed indicator were calibrated and leak checked on April 10, 1995. Additionally, the last recorded VOR test was performed on September 14, 1995.

#### METEOROLOGICAL INFORMATION

The Naples Airport ATIS "Q" that was monitored by the flightcrew before initiating the approach indicated that the recorded ceiling at 1155 was measured one thousand two hundred broken, with 6 miles of visibility in fog. The wind was from 150 degrees at 8 knots and the altimeter was 30.00 inHg. The Naples Airport is located about 11 nautical miles and 331 degrees magnetic from the Marco Island Airport.

According to the office assistant at the Marco Island Airport who was monitoring the CTAF at the time of the accident, one flightcrew member of the accident airplane reported that the flight was inbound to runway 35. The assistant broadcast to the flightcrew that runway 17 was the active but there was no response. The flightcrew member did not ask for the wind or altimeter setting. The flightcrew of another airplane that landed at the Marco Island Airport about 30 minutes before the accident reported executing the VOR/DME approach to runway 17. They did not continue the approach to minimums because the flight encountered VFR conditions about 4 miles from the airport. The flight crew landed on runway 17 which was the active runway and reported no discrepancies with the approach. The same flightcrew departed about 44 minutes after the airplane crashed and at that time the base of the clouds was 250-300 feet msl.

The Marco Island Airport is equipped with an Automated Weather Observing System (AWOS) but it was not operational/commissioned on the day of the accident.

#### AIDS TO NAVIGATION

The day of the crash about 2205 hours, the FAA began a ground based evaluation of the VOR/DME system which checked normally. The approach was not flight tested. Recorded radar data from the last approach control facility was not available.

#### AERODROME INFORMATION

Review of the Jeppesen Sanderson, Inc., approach chart dated 3 Nov 1995, which was the current chart revealed that the frequency of and radial from the Cypress VOR is 108.6 and 148 respectively. The minimum descent altitude from TIOFF which is the Final Approach Fix (FAF) to 2.7 nautical miles past TIOFF is 980 mean sea level (msl). After passing 2.7 nautical miles from TIOFF the published MDA is listed as 420 feet msl for a circling approach with the local altimeter setting or 500 feet msl with the Fort Myers altimeter setting. The 700.44 foot-tall antenna that is depicted on the approach chart is located about 1,900 feet east of the final approach course and 3.36 nautical miles and 337 degrees magnetic from the threshold of runway 17. The antenna location is between the FAF and 2.7 nautical miles past it. The minimum descent altitude above ground level for a straight-in landing to runway 17 at the Marco Island Airport while executing the VOR/DME approach is 354 feet with a local altimeter setting. The missed approach point is listed on the chart to be 10.8 nautical miles DME from the Cypress VOR.

#### FLIGHT RECORDERS

A cockpit voice recorder was recovered from the airplane and found to contain 30 minutes 41 seconds of recording of which 29 minutes 54 seconds of conversation was transcribed and is a part of the factual report. A flight data recorder was not installed in the airplane.

#### WRECKAGE AND IMPACT

Examination of the accident site revealed that the airplane impacted the ground of an open field on a flight path of about 034 degrees. An approximate 9-foot section of the left wing and section of the left wing aileron were found near an antenna that was located 1.75 nautical miles and about 260 degrees magnetic from the impact crater. Examination of the severed section of the left wing revealed that the upper surface skin was shorter in length from the wing tip than the lower surface skin. The angle was determined to be about 025 degrees. The wreckage located near the impact crater consisted of the separated right wing, separated engines, cockpit

section and empennage. The initial impact crater measured about 46 feet long, 9 feet wide, and 1.5 feet deep. Located in the crater were left engine and left wing components. Fire damage to weeds north of the impact crater was observed as well as fire damage along the wreckage path. Disintegrated portions of the separated left engine were found beginning about 116 feet from the initial impact crater and continued to 200 feet from the impact crater. The empennage and cockpit section which was heat damaged was located about 242 feet from the initial impact crater. Examination of the empennage revealed that the left horizontal stabilizer was displaced up at about a 45-degree angle and aft. The right wing was located about 267 feet from the impact crater and had sustained heat damage with the wing tip displaced up about 45 degrees. Examination of the wing spars of the right wing revealed evidence of positive overload failure. Continuing along the wreckage path was destroyed instrumentation from the cockpit, pilots and copilots seat assemblies, cabin door, and the right engine which was located about 705 feet from the initial impact crater. Examination of the aileron, rudder, and elevator flight controls revealed no evidence of preimpact failure or malfunction. The landing gear and speed brakes were determined to be retracted. Both engines were examined in Canada which revealed no evidence of preimpact failure or malfunction. A copy of the teardown report for both engines is an attachment to this report.

The pilot's altimeter was recovered and examination revealed the altimeter was set to 29.9X inHg with the last number not legible. The altimeter indicated between 380 and 400 feet. The copilots altimeter was also located and the altimeter setting was 30.01 inHg and indicated about 170 feet. No testing was performed to either unit.

#### MEDICAL AND PATHOLOGICAL

Post-mortem examinations of the pilot and copilot were performed by Marta U. Coburn, M.D., District Twenty Medical Examiner, Naples, Florida. The cause of death for both was listed as multiple blunt injuries. Toxicological testing of specimens of the PIC were performed by National Medical Services, Inc. (NMS), the FAA Accident and Research Laboratory (CAMI), and MedTox Laboratories, Inc. The results of analysis by the MedTox Laboratories was negative for tested drugs. The result of analysis by NMS was negative for alcohol and THC. The results of analysis by CAMI was negative for tested drugs.

Toxicological analysis of specimens of the copilot was performed by the CAMI, and NMS. The results of analysis by CAMI was negative for tested drugs and negative in vitreous fluid for ethanol.

#### TESTS AND RESEARCH

The broken guy wire by design was attached about 28 feet below the top of the 700.44 foot-tall tower and was the uppermost wire of a series of eight that were secured to a base located northwest of the tower. The 1/2 inch diameter cable was not secured to the attach point at the base and was wrapped around the remaining upper guy wires. The broken cable was later removed and examination revealed a dark spot on the cable lasting about 7 feet starting about 100 down from the attach point to the tower. This corresponds to about 587 feet above ground level. The upper guy wire was determined to be at about a 35-degree angle at the anchor attach point.

The day after the accident the lighting system to include monitor and emergency generator of the tower antenna were operationally checked which revealed no evidence of preimpact failure or malfunction. The tower lights are turned on by photoelectric cell. A study of the

paint on the tower by FCC engineers revealed it did not meet the specification required by FAA Advisory Circular AC70/7460-1, Obstruction Marking and Lighting.

#### ADDITIONAL DATA/INFORMATION

The operator of the airplane was a subscriber to Jeppesen Sanderson, Inc. approach charts and according to Jeppesen personnel, the most current revision at the time of the accident to the VOR/DME instrument approach plate was incorporated into Revision No. 28. This was posted on November 10, 1995, according to records found in the wreckage. The actual approach chart was not located in the wreckage.

The CVR was also examined to determine engine speed following the in-flight collision with the antenna guy wire and a copy of the Sound Spectrum Study is an attachment to this report.

The terminal building at the Marco Island Airport is located at the north end of the airport.

The wreckage with the exception of the retained engines and cockpit voice recorder was released to Mr. David Moon of Aviation Consultant Services, on January 3, 1996. The retained engines were released to Mr. Al E. Sharp of Aviation Consultant Services on July 2, 1996. The retained cockpit voice recorder and flight and maintenance logs were released to Mr. R.M. Barrett, Claims Manager of U.S. Aviation Underwriters, Inc., on September 17, 1996.

#### Pilot Information

|                                  |                                                                                                                                                                                                                                               |                                          |            |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------|
| <b>Certificate:</b>              | Airline Transport; Flight Instructor; Commercial                                                                                                                                                                                              | <b>Age:</b>                              | 57, 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>                   |            |
| <b>Instrument Rating(s):</b>     | Airplane                                                                                                                                                                                                                                      | <b>Second Pilot Present:</b>             | Yes        |
| <b>Instructor Rating(s):</b>     | Airplane Multi-engine; Airplane Single-engine; Instrument Airplane                                                                                                                                                                            | <b>Toxicology Performed:</b>             | Yes        |
| <b>Medical Certification:</b>    | Class 1 Valid Medical--w/ waivers/lim.                                                                                                                                                                                                        | <b>Last FAA Medical Exam:</b>            | 12/01/1995 |
| <b>Occupational Pilot:</b>       |                                                                                                                                                                                                                                               | <b>Last Flight Review or Equivalent:</b> |            |
| <b>Flight Time:</b>              | 13026 hours (Total, all aircraft), 2500 hours (Total, this make and model), 11753 hours (Pilot In Command, all aircraft), 87 hours (Last 90 days, all aircraft), 41 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft) |                                          |            |

## Aircraft and Owner/Operator Information

|                               |                                      |                                |             |
|-------------------------------|--------------------------------------|--------------------------------|-------------|
| Aircraft Make:                | Cessna                               | Registration:                  | N91MJ       |
| Model/Series:                 | 550 550                              | Aircraft Category:             | Airplane    |
| Year of Manufacture:          |                                      | Amateur Built:                 | No          |
| Airworthiness Certificate:    | Normal                               | Serial Number:                 | 550-0101    |
| Landing Gear Type:            | Retractable - Tricycle               | Seats:                         | 9           |
| Date/Type of Last Inspection: | 04/13/1995, Continuous Airworthiness | Certified Max Gross Wt.:       | 13300 lbs   |
| Time Since Last Inspection:   | 142 Hours                            | Engines:                       | 2 Turbo Fan |
| Airframe Total Time:          | 6025 Hours                           | Engine Manufacturer:           | P&W         |
| ELT:                          | Not installed                        | Engine Model/Series:           | JT15D-4     |
| Registered Owner:             | MORAN FOODS, INC.                    | Rated Power:                   | 2500 lbs    |
| Operator:                     | MORAN FOODS, INC.                    | Operating Certificate(s) Held: | None        |

## Meteorological Information and Flight Plan

|                                  |                           |                                      |                  |
|----------------------------------|---------------------------|--------------------------------------|------------------|
| Conditions at Accident Site:     | Instrument Conditions     | Condition of Light:                  | Day              |
| Observation Facility, Elevation: | APF, 9 ft msl             | Distance from Accident Site:         | 7 Nautical Miles |
| Observation Time:                | 1218 EST                  | Direction from Accident Site:        | 330°             |
| Lowest Cloud Condition:          | Unknown / 0 ft agl        | Visibility                           | 6 Miles          |
| Lowest Ceiling:                  | Broken / 800 ft agl       | Visibility (RVR):                    | 0 ft             |
| Wind Speed/Gusts:                | 12 knots /                | Turbulence Type Forecast/Actual:     | /                |
| Wind Direction:                  | 150°                      | Turbulence Severity Forecast/Actual: | /                |
| Altimeter Setting:               | 29 inches Hg              | Temperature/Dew Point:               | 23°C / 19°C      |
| Precipitation and Obscuration:   |                           |                                      |                  |
| Departure Point:                 | CAHOKIA/ST LOUI, IL (CPS) | Type of Flight Plan Filed:           | IFR              |
| Destination:                     | MARCO ISLAND, FL (MKY)    | Type of Clearance:                   | IFR              |
| Departure Time:                  | 0824 CST                  | Type of Airspace:                    | Class G          |

## Airport Information

|                      |                    |                           |         |
|----------------------|--------------------|---------------------------|---------|
| Airport:             | MARCO ISLAND (MKY) | Runway Surface Type:      |         |
| Airport Elevation:   | 6 ft               | Runway Surface Condition: |         |
| Runway Used:         | 0                  | IFR Approach:             | VOR/DME |
| Runway Length/Width: |                    | VFR Approach/Landing:     |         |



## Wreckage and Impact Information

|                     |         |                      |           |
|---------------------|---------|----------------------|-----------|
| Crew Injuries:      | 2 Fatal | Aircraft Damage:     | Destroyed |
| Passenger Injuries: | N/A     | Aircraft Fire:       | On-Ground |
| Ground Injuries:    | N/A     | Aircraft Explosion:  | On-Ground |
| Total Injuries:     | 2 Fatal | Latitude, Longitude: |           |

## Administrative Information

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                          |              |            |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------|
| Investigator In Charge (IIC):     | TIMOTHY W MONVILLE                                                                                                                                                                                                                                                                                                                                                                                                       | Report Date: | 01/08/1997 |
| Additional Participating Persons: | PEGGY MARDERS; MIAMI, FL<br>JOHN O FRANKLIN; JUPITER, FL<br>JOSEPH A HUTTERER; WICHITA, KS<br>ROGER D FRICK; MINNEAPOLIS, MN                                                                                                                                                                                                                                                                                             |              |            |
| 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:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.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](#).