



National Transportation Safety Board Aviation Accident Final Report

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| Location: | ROOSEVELT ROADS, PR | Accident Number: | MIA97LA036 |
| Date & Time: | 12/11/1996, 1224 AST | Registration: | N353T |
| Aircraft: | Beech 18G | Aircraft Damage: | Destroyed |
| Defining Event: | | Injuries: | 1 Fatal |
| Flight Conducted Under: | Part 135: Air Taxi & Commuter - Non-scheduled | | |

Analysis

At 1136 AST, the twin engine airplane departed San Juan, PR, on a flight to St Vincent. About 1208 AST, the pilot contacted ATC and indicated that he would like to divert to St Thomas. He informed the controller that he had 'feathered' the left engine due to loss of the left engine cowling, but he did not declare an emergency. He requested wind information for St Thomas, then at about 1613 AST, he changed his destination to Roosevelt Roads, PR. At 1120 AST, the pilot reported that the airplane was losing about 300'/min, then about 1 minute later, he said he was going to attempt an engine restart, and that the airplane was getting close to the water. A short time later, he informed ATC that he was not going to make it to shore. The pilot acknowledged info that search and rescue personnel were responding, then there was not further contact with the airplane. The airplane was located about 6 miles east of Roosevelt Roads NAS, but the pilot was not found. Review of weight and balance info revealed the pilot did not follow written procedures, and that the airplane exceeded the maximum authorized gross weight for take off. Flight crews had been informed of a communique from the manufacturer that there was no need to shut down an engine and feather the propeller unless engine performance or a major vibration problem confirmed the need.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper planning/decision concerning separation of the left engine cowling. Factors relating to the accident were: the pilot's failure to perform weight and balance calculations, and/or to ensure the airplane was loaded in accordance with company procedures and the airplane flight manual; loss of the left engine cowling for undetermined reasons; and the pilot's decision not to follow written procedures by intentionally shutting down the left engine and feathering the propeller.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE - NORMAL

Findings

1. (F) COOLING SYSTEM,COWLING - UNDETERMINED
 2. (F) COOLING SYSTEM,COWLING - SEPARATION
 3. (F) EMERGENCY PROCEDURE - NOT FOLLOWED - PILOT IN COMMAND
 4. (F) ENGINE SHUTDOWN - PERFORMED - PILOT IN COMMAND
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Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

5. (C) PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
 6. (F) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - PILOT IN COMMAND
 7. FLIGHT TO NEW DESTINATION
 8. ALTITUDE - NOT MAINTAINED - PILOT IN COMMAND
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Occurrence #3: DITCHING
Phase of Operation: EMERGENCY LANDING

Findings

9. (F) TERRAIN CONDITION - WATER,ROUGH

Factual Information

On December 11, 1996, about 1224 Atlantic standard time, a Beech 18, N353T, Tol-Air flight 353, registered to Tol-Air Services, operated by MBD Corporation as a 14 CFR Part 135 on-demand cargo flight, crashed about 6 miles east of Roosevelt Roads Naval Air Station, in the Caribbean Sea. Visual meteorological conditions prevailed and no flight plan was filed. The airplane was not recovered and is presumed to be destroyed. The airline transport pilot was not located and is presumed to be fatally injured. The flight originated from San Juan, Puerto Rico, about 53 minutes before the accident

Review of radio communication between Tol-Air 353 (TOL353), San Juan Center Radar Approach Control (SJU-CERAP), and Roosevelt Roads Approach Control (NRR-ATCT) revealed TOL353 informed SJU-CERAP at 1608:02, "tol air three five three we'd like to return maybe to Saint Thomas that be o-k." SJU-CERAP instructed him to turn to the left and to contact Saint Thomas Tower. TOL353 requested to remain on frequency and stated at 1609:51, "we're a single engine twinbeech now," and requested the Saint Thomas winds which were provided. TOL353 did not declare an emergency. At 1612:43 TOL353 stated, "ah think there's a chance we might get to rosy." SJU-CERAP informed him that Vieques was to his right. TOL353 stated he had a visual on Culebra, and stated from there that he would like to go to Roosevelt Roads. SJU-CERAP coordinated the request with NRR-ATCT, and instructed TOL353 to contact NRR-ATCT at 1615:59. TOL353 informed NRR-ATCT at 1616:26, that he was a single engine beech, lost the left engine cowling, and that he was inbound to get it cleaned up. He was cleared to descend at pilot's discretion and to continue inbound. TOL353 informed approach at 1620:12, that he was losing about 300 feet per minute and that the left engine was feathered. At 1621:14, TOL353 informed approach, "I'm gonna try to get that thing restarted the cowling is coming off ok," and was instructed to continue inbound. A short time later TOL353 informed approach that he was getting close to the water. At 1622:57 TOL353 stated, "I don't think were gonna make it." TOL353 was informed that search and rescue was on the way. TOL353 stated, "understand," and there was no other recorded communication with TOL353.

A military helicopter arrived on scene, observed a debris trail, fuel slick, and marked the crash site location. Another military helicopter arrived on scene, and deployed snorklers. No personnel were visible within the fuselage/cabin wreckage. The search area was expanded and resulted in negative sightings.

All pertinent aviation regulations, 14 CFR Part 135, airman competency and proficiency checks had been recorded as conducted. (For additional first pilot information, see page 3 of this report.)

Review of the Supplemental Type Certificate SA572WE, and FAA Form 337 on file at Oklahoma City, Oklahoma, revealed that N353T, serial no. BA-485 had Hamilton Standard Propellers, model 22D30, installed on Feb 3, 1993. There is no record of any alteration or modification that would increase the gross weight of N353T. Review of FAA Form 337, dated February 20, 1974, indicates that the gross weight of N517E (N353T) is 9,800 pounds. The flight manual supplement for N220WH indicates its takeoff gross weight is 10,100 pounds. There is no flight manual supplement for N353T. A search for historical records by the Director of Maintenance, MBD Corporation, pertaining to any alterations or modifications increasing the maximum gross weight of N353T to 10,100 pounds, resulted in negative findings.

Review of the cargo manifest obtained from American Eagle, revealed that N353T had

1,640 pounds of cargo. The TolAir manifest indicates that N353T had 1,601 pounds of cargo. MBD Corporation, aircraft weight and balance procedures requires the pilot-in-command to prepare a duplicate load manifest before each take off. A copy of the manifest is required to be left with an agent before departure, or be deposited in the white box in the pilot room. This procedure was not complied with before the airplane departed San Juan. In addition, crewmembers are required to compute the pilot weight at 170 pounds instead of actual pilot weight. The pilot weighed 203 pounds according to his medical certificate. The maximum gross weight with (1,640 lbs cargo/pilot weight 203 lbs) at take off is 10229 pounds. The landing weight 53 minutes after take off is 9,983 pounds. The maximum gross weight with (1,640 lbs cargo/pilot weight 170 lbs) at take off is 10196 pounds. The landing weight 53 minutes after take off is 9,950 pounds. The maximum gross weight with (1601 lbs cargo/pilot weight 203 lbs) at take off is 10190 pounds. The landing weight 53 minutes after take off is 9,944 pounds. The maximum gross weight with (1,601 lbs cargo/pilot weight 170 lbs) at take off is 10157 pounds. The landing weight 53 minutes after take off is 9,911 pounds.

Review of MBD Corporation, aircraft flight and maintenance log for N353T revealed 16 write-ups on the left engine cowling, and 1 write-up on the right engine cowling during the last year before the accident. The left engine cowling had moved forward into the propeller system on two separate occasions. Review of two other BE-18 logbooks revealed one airplane had one write up on the left and right engine cowling. The other airplane had one write up on the right engine cowling. The Director of Maintenance, for MBD Corporation, could not explain why the left engine cowling on N353T had so many write ups .

MBD Corporation issued a memorandum on May 19, 1996, to all B-18 crews reference engine cowls. The memorandum stated that the B-18 aircraft is required to have at least three fasteners on the upper half and three fasteners on the lower engine cowling. In addition, the B-18 crews were informed that there was the possibility that the cowling may come loose in flight, resulting in the cowling shifting forward and press against the moving propeller. In the event this occurred, the crews were instructed that they must do the following:

1. Do not feather the propeller.
2. Reduce power (not to idle power) on the appropriate engine, reduce airspeed and continue flying.
3. Land as soon as possible. This situation will not allow you to continue indefinitely.

The memorandum stated that the policy had been approved by Beechcraft. The Director of Operations, for MBD Corporation, stated the accident pilot was aware of the requirements of the memorandum.

Beechcraft issued a Beechcraft Safety Communique in October 1995. The communique stated, ..."although there have been reports of unlatched doors and engine cowlings opening in cruise flight....Do not permit yourself to be distracted. ALWAYS MAINTAIN CONTROL OF THE AIRPLANE. There may be a reduction in climb performance, but the airplane can be flown to pattern altitude and landed safely using normal procedures....On twin engine airplanes, there is no need to shut down an engine and feather the propeller unless engine performance or major vibration problem confirm the need." Raytheon Aircraft stated in a letter dated January 22, 1997, "Our customer support department advises that Raytheon Aircraft Company has never authorized operation of a model 18 with any engine cowl fasteners missing or otherwise inoperative. All fasteners are required to be in place, functional, and properly

fastened prior to flight. With regard to the MBD Corporation procedure intended for use in the event an engine cowling comes "loose," I am unable to locate any Raytheon Aircraft Company employee who is aware that we have ever approved such a procedure."

Pilot Information

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| Certificate: | Airline Transport; Commercial | Age: | 46, Male |
| Airplane Rating(s): | Multi-engine Land; Multi-engine Sea; Single-engine Land; Single-engine Sea | Seat Occupied: | Unknown |
| Other Aircraft Rating(s): | Helicopter | Restraint Used: | |
| Instrument Rating(s): | Airplane | Second Pilot Present: | No |
| Instructor Rating(s): | None | Toxicology Performed: | No |
| Medical Certification: | Class 2 Valid Medical--w/ waivers/lim. | Last FAA Medical Exam: | 10/01/1996 |
| Occupational Pilot: | | Last Flight Review or Equivalent: | |
| Flight Time: | 16345 hours (Total, all aircraft), 385 hours (Total, this make and model), 40 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

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| Aircraft Make: | Beech | Registration: | N353T |
| Model/Series: | 18G 18G | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Normal | Serial Number: | BA-485 |
| Landing Gear Type: | Retractable - Tailwheel | Seats: | 2 |
| Date/Type of Last Inspection: | 12/10/1996, 100 Hour | Certified Max Gross Wt.: | 9800 lbs |
| Time Since Last Inspection: | 6 Hours | Engines: | 2 Reciprocating |
| Airframe Total Time: | 8203 Hours | Engine Manufacturer: | P&W |
| ELT: | Installed | Engine Model/Series: | R-985-AN-14B |
| Registered Owner: | TOL-AIR SERVICES INC. | Rated Power: | 450 hp |
| Operator: | MBD CORPORATION | Operating Certificate(s) Held: | On-demand Air Taxi (135) |
| Operator Does Business As: | | Operator Designator Code: | FIUA |

Meteorological Information and Flight Plan

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|----------------------------------|-------------------------|---|-------------------|
| Conditions at Accident Site: | Visual Conditions | Condition of Light: | Day |
| Observation Facility, Elevation: | STT, 24 ft msl | Distance from Accident Site: | 20 Nautical Miles |
| Observation Time: | 1200 AST | Direction from Accident Site: | 90° |
| Lowest Cloud Condition: | Scattered / 2000 ft agl | Visibility | 15 Miles |
| Lowest Ceiling: | Broken / 5000 ft agl | Visibility (RVR): | 0 ft |
| Wind Speed/Gusts: | 18 knots / 15 knots | Turbulence Type Forecast/Actual: | / |
| Wind Direction: | 30° | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | 30 inches Hg | Temperature/Dew Point: | 27° C / 22° C |
| Precipitation and Obscuration: | | | |
| Departure Point: | SAN JUAN, PR (SJU) | Type of Flight Plan Filed: | None |
| Destination: | (NRR) | Type of Clearance: | None |
| Departure Time: | 1136 AST | Type of Airspace: | Class G |

Wreckage and Impact Information

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| Crew Injuries: | 1 Fatal | Aircraft Damage: | Destroyed |
| Passenger Injuries: | N/A | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 1 Fatal | Latitude, Longitude: | |

Administrative Information

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|-----------------------------------|--|--------------|------------|
| Investigator In Charge (IIC): | CARROL A SMITH | Report Date: | 05/30/1997 |
| Additional Participating Persons: | ERIC APONTE; SAN JUAN, PR | | |
| 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 pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ . | | |

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](#).