

**NATIONAL TRANSPORTATION SAFETY BOARD****Public Meeting of October 13, 2004****(Information subject to editing)****Report of Aviation Accident****In-Flight Engine Failure and Subsequent Ditching****Air Sunshine, Inc., Flight 527****About 7.35 Nautical Miles West-Northwest of Treasure Cay Airport,****Great Abaco Island, Bahamas****July 13, 2003****NTSB/AAR-04/03**

This is a synopsis from the Safety Board's report and does not include the Board's rationale for the conclusions, probable cause, and safety recommendations. Safety Board staff is currently making final revisions to the report from which the attached conclusions and safety recommendations have been extracted. The final report and pertinent safety recommendation letters will be distributed to recommendation recipients as soon as possible. The attached information is subject to further review and editing.

**EXECUTIVE SUMMARY**

On July 13, 2003, about 1530 eastern daylight time, Air Sunshine, Inc. (doing business as Tropical Aviation Services, Inc.), flight 527, a Cessna 402C, N314AB, was ditched in the Atlantic Ocean about 7.35 nautical miles west-northwest of Treasure Cay Airport (MYAT), Treasure Cay, Great Abaco Island, Bahamas, following the in-flight failure of the right engine. Four of the nine passengers sustained no injuries, three passengers and the pilot sustained minor injuries, and one adult and one child passenger died after they evacuated the airplane. The airplane sustained substantial damage. The airplane was being operated under the provisions of 14 *Code of Federal Regulations* Part 135 as a scheduled international passenger commuter flight from Fort Lauderdale Hollywood/International Airport, Fort Lauderdale, Florida, to MYAT. Visual meteorological conditions prevailed for the flight, which operated on a visual flight rules flight plan.

**CONCLUSIONS**

1. The pilot was properly certificated and qualified under Federal regulations. No evidence indicated any preexisting medical or physical condition that might have adversely affected the pilot's performance during the accident flight.
2. The airplane was properly certificated and equipped in accordance with Federal regulations. The

airplane was equipped with Federal Aviation Administration•approved flotation gear, as required by Federal regulations.

3. The accident airplane was loaded in accordance with Federal Aviation Administration-approved company weight and balance procedures. The weight and balance of the airplane were within prescribed limits during all phases of the flight.
4. Given the distance from shore at which the ditching occurred and the availability of emergency response equipment, the search and rescue efforts were timely and appropriate. The accident was survivable.
5. The inoperative distance measuring equipment on the Treasure Cay Airport very high frequency omnidirectional range was not a factor in this accident.
6. The Federal Aviation Administration's oversight of Air Sunshine was in accordance with standard guidelines, but was insufficient to detect inadequate maintenance record-keeping and practices at Air Sunshine.
7. The airplane's right engine failed while the airplane was descending through an altitude of about 3,500 feet.
8. Several factors contributed to the degradation of the airplane's performance and its inability to maintain flight and reach land, including the windmilling propeller, the protruding magnetos, the open right engine cowl flap, and the possibility that the flaps were extended to 15° at some point during the descent.
9. During the descent from 3,500 to 2,000 feet, the airplane's descent rate was between about 560 and 212 feet per minute (fpm), and, during the descent from 2,000 feet to contact with the water, its descent rate was between 429 and 360 fpm.
10. If the average descent rate had been about 200 feet per minute or less, the airplane would have been able to maintain flight and reach the Treasure Cay Airport.
11. The right propeller was in the fully feathered position, but Safety Board investigators could not determine at what point the propeller became fully feathered.
12. Two or more of the right engine No. 2 cylinder hold-down nuts became loose and backed off of the studs, which resulted in the remaining studs and through bolts fracturing in high-stress fatigue, allowing the cylinder to separate from the engine.
13. The simultaneous loosening of two or more of the right engine No. 2 cylinder hold•down nuts resulted from the application of insufficient torque, which was applied by Air Sunshine maintenance personnel during undocumented maintenance.

14. At the time of the accident, Air Sunshine's maintenance record keeping and practices were not adequate.
15. The pilot had a history of below-average proficiency before the accident flight, including numerous failed FAA flight tests, which contributed to his inability to maintain maximum flight performance and reach land after the right engine failed.
16. The pilot was not wearing his shoulder harness during the ditching, and because he was not wearing his harness, he sustained a head injury that reduced his ability to assist passengers after the ditching.
17. After determining that he was going to ditch the airplane, the pilot failed to conduct an emergency briefing, which was required by the emergency ditching procedures contained in Air Sunshine's General Operations Manual, and this failure contributed to passenger fatalities.
18. The passengers would have had sufficient time to retrieve and don their personal flotation devices if the pilot had instructed them to do so shortly after the right engine failed.
19. Having pilots provide adequate emergency briefings to passengers is an important survival factor.

## **PROBABLE CAUSE**

The National Transportation Safety Board determines that the probable cause of this accident was the in-flight failure of the right engine and the pilot's failure to adequately manage the airplane's performance after the engine failed. The right engine failure resulted from inadequate maintenance that was performed by Air Sunshine's maintenance personnel during undocumented maintenance. Contributing to the passenger fatalities was the pilot's failure to provide an emergency briefing after the right engine failed.

## **SAFETY RECOMMENDATION**

### **To the Federal Aviation Administration:**

1. Issue a flight standards information bulletin to principal operations inspectors of all Part 135 single-pilot operators that carry passengers and operate over water, which familiarizes them with the circumstances of the Air Sunshine flight 527 accident and emphasizes the need for pilots to provide timely emergency briefings. The bulletin should state that these briefings should include, at a minimum, information about the location and operation of the on-board emergency equipment and exits.

Adopted pending revisions and additional recommendations.