

NTSB Findings

1. The captain and the first officer were properly certificated and qualified under Federal regulations. No evidence indicated any medical or behavioral conditions that might have adversely affected their performance during the accident flight. There was no evidence of flight crew fatigue.
2. The accident airplane was certificated and equipped in accordance with Federal regulations. The recovered components showed no evidence of any system or powerplant failures but showed evidence of multiple failures of wing structural components.
3. The fire damage to the fuselage and empennage was a result of the failure of the right wing and the subsequent breach in the wing fuel tank.
4. The accident was not survivable. The emergency response was timely.
5. There was no evidence from the performance or appearance of the airplane that would have provided warning to the flight crew of the right wing's imminent failure, and there was nothing that the crew could have done to regain control of the airplane after the in-flight separation of the right wing.
6. The right wing separated from the accident airplane at wing station 34 because of preexisting fatigue fractures and cracks in the rear Z-stringer, lower skin, and rear spar lower spar cap, and this multiple-element fatigue damage reduced the residual strength capability of the wing structure and caused the fatigue failure of the wing during normal flight operations.
7. The repetitive fuel leaks near the area where the accident airplane's right wing separated from the fuselage were indicators of structural damage inside the right wing.
8. Chalk's Ocean Airways most likely performed the doubler repair to the accident airplane's lower skin at right wing station 34, and this repair should have been reflected in the company's maintenance records.
9. The doubler repair to the accident airplane's lower wing skin at right wing station 34 was ineffective because the doublers did not restore the load-carrying capability of the skin in the area of the fuel sump drain and the repair did not properly address the underlying cause of the skin cracking, which was the cracked or fractured rear Z-stringer.
10. The establishment of repair thresholds in all maintenance programs would help ensure that repeated occurrences of a specific discrepancy are sufficiently evaluated.
11. On the basis of the repetitive nature of the fuel leaks on the accident airplane and the structural damage that was found during the fuel leak inspection of another company airplane that led to the August 2005 replacement of that airplane's lower right wing skin and stringers, Chalk's Ocean Airways should have performed a comprehensive inspection of and maintenance on the wing structures of the airplanes in its fleet.
12. The failure of Chalk's Ocean Airways to identify and properly repair fatigue cracks in the accident airplane's wing structure and the numerous maintenance-related problems found on the accident airplane and another company airplane demonstrate that the company's maintenance program and practices were deficient, and these deficiencies were causal to the accident.
13. The Chalk's Ocean Airways maintenance program plan was inadequate to maintain the structural integrity of its aircraft fleet.
14. The Federal Aviation Administration's (FAA) procedures for maintenance program oversight, when applied to commercial operators of aircraft with limited manufacturer or

engineering support, such as Chalk's Ocean Airways, are insufficient to ensure the adequacy of such programs' structural airworthiness plans and, thus, the safety of such aircraft operations, and the FAA's failure to identify the inadequacy of the Chalk's Ocean Airways maintenance program was causal to the accident.

15. Updating Federal Aviation Administration (FAA) Order 8300.10, Airworthiness Inspector's Handbook, with the latest Continuing Analysis and Surveillance System (CASS) guidance and an explanation of this guidance would help FAA aviation safety inspectors ensure that CASS programs are being effectively implemented at 14 Code of Federal Regulations Part 121 air carriers.
16. The Federal Aviation Administration received sufficient cues from a number of sources to alert it to potential safety deficiencies at Chalk's Ocean Airways, and these cues should have prompted heightened vigilance and additional surveillance of the operator.
17. The Federal Aviation Administration missed an opportunity to recertify the Grumman Mallard (G-73T) airplane with a new type certificate that would likely have included a fatigue analysis of the airplane. Such a fatigue analysis likely would have included a determination of a safe operating life for the wing structure that would have been used as the basis for inspection and retirement requirements that could have prevented the accident.