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ATSB TRANSPORT SAFETY INVESTIGATION REPORT
Aviation Occurrence Report – 200506780
Final

Lightning Strike
Near Darwin, NT
Fokker B.V. F28 Mk 100, VH-FWI
17 December 2005

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Lightning Strike, Near Darwin, NT, VH-FWI Fokker F28 Mk 100, 17 December 2005.

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Abstract

At approximately 1620 CST[1] on 17 December 2005, a Fokker 100 series aircraft, registered VH-FWI, with 14 passengers and a crew of 5 was returning to Darwin on a charter flight from the Indonesian port of Kupang.

On approach to Darwin, the crew were instructed by air traffic control to hold approximately 50 NM to the south of Darwin due to thunderstorms at the airport. The crew reported that, while holding in instrument meteorological conditions at approximately 16,000 ft above ground level, and between 6 and 8 NM from any storm cells, the aircraft was stuck by lightning.

While the aircraft was still holding, approximately 20 minutes after the lighting strike, the number-2 hydraulic system low quantity warning light illuminated and the number-1 hydraulic system quantity was observed to be reducing. The aircraft was then immediately tracked for a landing on runway 29 at Darwin.

The number-1 hydraulic system low quantity warning light illuminated when the crew selected the landing gear and flap, early on final approach to land. The landing was continued and the aircraft was able to be taxied to the gate.

An engineering examination found that two of the hydraulic return lines to the elevator boost unit and a hydraulic union and attaching line were damaged, due to electrical arcing as a result of the lightning strike. The examination also found at least two strike holes to the forward and mid-section of the aircraft fuselage. There were approximately 90 other strike related damage zones along the underside of the fuselage, landing gear doors and on the trailing edges of the wings and tailplane.

During subsequent scheduled maintenance, further melting damage was found to the elevator flight control cables.

The aircraft operator reported that the aircraft was repaired and returned to service.

1 The 24-hour clock is used in this report to describe the local time of day, Central Standard Time, when particular events occurred. Central Standard Time is Coordinated Universal Time (UTC) + 9.5 hours.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Transport and Regional Services. ATSB investigations are independent of regulatory, operator or other external bodies.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations. Accordingly, the ATSB also conducts investigations and studies of the transport system to identify underlying factors and trends that have the potential to adversely affect safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements. The object of a safety investigation is to determine the circumstances in order to prevent other similar events. The results of these determinations form the basis for safety action, including recommendations where necessary. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations.

It is not the object of an investigation to determine blame or liability. However, it should be recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. That material will at times contain information reflecting on the performance of individuals and organisations, and how their actions may have contributed to the outcomes of the matter under investigation. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. While the Bureau issues recommendations to regulatory authorities, industry, or other agencies in order to address safety issues, its preference is for organisations to make safety enhancements during the course of an investigation. The Bureau prefers to report positive safety action in its final reports rather than making formal recommendations. Recommendations may be issued in conjunction with ATSB reports or independently. A safety issue may lead to a number of similar recommendations, each issued to a different agency.

The ATSB does not have the resources to carry out a full cost-benefit analysis of each safety recommendation. The cost of a recommendation must be balanced against its benefits to safety, and transport safety involves the whole community. Such analysis is a matter for the body to which the recommendation is addressed (for example, the relevant regulatory authority in aviation, marine or rail in consultation with the industry).

FACTUAL INFORMATION

The information presented below, including any analysis of that information, was prepared principally from information supplied to the Bureau.

At approximately 1620 CST[2] on 17 December 2005, a Fokker 100 series aircraft, registered VH-FWI, with 14 passengers and a crew of 5 was returning to Darwin on a charter flight from the Indonesian port of Kupang.

On approach to Darwin, the crew were instructed by air traffic control to hold approximately 50 NM to the south of Darwin due to thunderstorms at the airport. The crew reported that, while holding in instrument meteorological conditions at approximately 16,000 ft above ground level, and between 6 and 8 NM from any storm cells, the aircraft was stuck by lightning.

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During subsequent scheduled maintenance, further melting damage was found to the elevator flight control cables.

The aircraft operator reported that the aircraft was repaired and returned to service.

Further reading

Further reading on lightning strikes can be found in the Civil Aviation Safety Authority's (CASA) *Flight Safety Australia* article *Bolt from the blue*. The article can be accessed from the CASA website at:

http://www.casa.gov.au/fsa/2005/aug/48-50.pdf

Additionally, in April 2005, the Australian Transport Safety Bureau published a research report; *The interpretation and use of weather radar displays in aviation*. That report can be accessed at:

http://www.atsb.gov.au/publications/2005/weatherradar.aspx

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