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The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements.

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INFRA-08406

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Smoke in cabin – near Adelaide, SA

23 July 2007

Abstract

A Fokker F27-50 aircraft, registered VH-FKZ, had departed Adelaide Airport, SA, on a scheduled passenger service to Olympic Dam SA. During the initial climb, the cabin crew advised the flight crew that there was smoke haze in the cabin. The flight crew returned the aircraft to Adelaide Airport with no reported injuries.

An examination of the right engine indicated that the number-4 bearing had failed.

FACTUAL INFORMATION

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

On 23 July 2007, at 1547 Central Standard Time¹, a Fokker F27-50 aircraft, registered VH-FKZ, had departed Adelaide Airport, SA, on a scheduled passenger service to Olympic Dam SA. During the initial climb, the cabin crew advised the flight crew that there was smoke haze in the cabin. Soon afterwards, the forward cargo bay master warning light illuminated and the flight crew instructed the cabin crew to discharge the forward cargo bay fire extinguisher. The flight crew advised Air Traffic Control (ATC) of the smoke haze and requested clearance for an immediate return to Adelaide. The crew further advised that they

expected a normal approach and landing, but requested that the airport Rescue and Fire Fighting Service (RFSS) be placed on standby. ATC then declared an uncertainty phase.

During the approach, the rear cargo bay master fire warning light illuminated and the flight crew instructed the cabin crew to discharge the rear cargo bay fire extinguisher. After a normal landing, the aircraft was taxied to the arrival bay without further incident. There were no reported injuries.

During a post-flight examination, the operator's engineering personnel found evidence of oil accumulation on the right engine gas generator case, forward of the high pressure impeller. Several chip detectors for the right engine and its accessories, including the oil tank, were found to be contaminated with metal.

The right engine and propeller were removed from the aircraft to enable detailed internal examination at a specialist facility. The examination found metal contamination on two other chip detectors on the engine. The number-4 bearing (part number 3111618-01) had failed and a section of the outer cage from the bearing was missing. All of the ball bearings were accounted for and showed evidence of distress. At the time of the failure, the number-4 bearing had accumulated 18,781 hours in service. As a result of metal contamination, several other areas of damage were observed throughout the engine, including to the number-4 bearing air/oil seal.

The specialist report concluded that the metal contamination in the engine was a result of the material failure of the number-4 bearing that had accumulated a high time in service. All the other

1 The 24-hour clock is used in this report to describe the local time of day Central Standard Time (CST), as particular events occurred. Central Standard Time was Coordinated Universal Time (UTC) + 10 hours.

damage to the engine was a result of the failure of the number-4 bearing and the subsequent metal contamination following the bearing failure. This included the damage to the number-4 bearing air/oil seal which resulted in the cabin haze, created by oil entering the cabin air-conditioning system.

Due to the high time in service of the number-4 bearing, and the absence of a history of similar failures, no safety action is planned; however, the aircraft operator has provided a copy of the specialist report to the Australian Civil Aviation Safety Authority.

FINDINGS

From the evidence available, the following findings are made with respect to the smoke in cabin event on VH-FKZ, near Adelaide Airport on 23 July 2007 and should not be read as apportioning blame or liability to any particular organisation or individual.

Contributing Safety Factors

Failure of the right engine number-4 bearing resulted in a smoke haze being reported in the cabin.

SOURCES AND SUBMISSIONS

Sources

- The aircraft operator

Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003*, the Executive Director may provide a draft report, on a confidential basis, to any person whom the Executive Director considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the Executive Director about the draft report.

A draft of this report was provided to the aircraft operator who made a submission on the report. The submission was reviewed and, where considered appropriate, the text of the report was amended accordingly.