

PRELIMINARY REPORT

Date: 25. October 2007

No: 1/2007

The under mentioned accident is under investigation by AIB-Norway.
12 months have passed since the time of the accident, subject to this is the following.

Aircraft information:

- Type and reg.: BAe146-200, OY-CRG
Operator: Atlantic Airways Faroe Islands P/F
Radio call sign.: FLI670
Date and time: Tuesday 10. October 2006 time 0533 UTC
Location: Stord airport Sørstokken, Norway (ENSO) (59°47'50''N 005°19'53''E)
Type of occurrence: Aircraft accident, overrun runway after landing
Type of flight: Commercial operations, none scheduled
Injuries to persons: 4 fatalities, 6 seriously injured, 6 minor or not injured
Damage to aircraft: Totally damaged and burned-out with exemption of parts from cockpit, engines and tail.

SUMMARY

The airline company Atlantic Airways has operated the aircraft type BAe146 since 1988. The company provides chartered flights for Aker Kværner, among other things.

Stord airport, Sørstokken, is approved for general aircraft traffic for aircraft up to reference code 2C, which includes the BAe146 aircraft type.

OY-CRG was flying from Stavanger airport Sola (ENZV) to Stord airport Sørstokken. There were 12 passengers, two cabin crew members and two pilots on board. The aircraft was on schedule for its planned time of arrival. The commander was flying the aircraft. The crew were familiar with the airport at Stord.

Before OY-CRG started its approach, the airport performed a routine runway inspection. The runway report did not contain information with regard to whether the runway was dry, damp or wet. Because the crew were not informed otherwise, they assumed that the runway was dry. However, investigations by the AIBN have revealed that the runway was in fact damp.

A corresponding aircraft had performed a normal landing towards the south (runway 15) 15 minutes earlier. The crew of OY-CRG were given a wind reading of 120° 6 knots. They had visual contact with the airport at an early stage and decided to carry out a visual approach northwards (runway 33).

Upon landing the pilots noted that the aircraft's lift spoilers did not deploy. The indicator lights that normally light up after 3 seconds did not do so. The pilots immediately called "No spoilers". Thereafter the pilots experienced that the maximum application of the brakes did not lead to the expected retardation. The alternative braking system was brought into use and then finally the emergency system, without this making any difference. The emergency system does not prevent the wheels from locking. Witnesses observed grey/blue smoke behind the main wheels.

The commander had a certain directional control of the aircraft and wanted to avoid leaving the runway at places where he knew that the terrain was particularly unfavourable. The aircraft left the runway end to the north at a relatively low speed. It continued down a steep slope and the aircraft sustained significant damage as it crashed into lighting poles, trees and large rocks.

When the aircraft came to rest, it was not possible to stop the left inner engine (no. 2) due to the damage. It continued to operate at a high rpm for several minutes. The forward left emergency exit could not be opened due to damage to the fuselage that had jammed the door. The forward right emergency exit was blocked by the terrain outside. The commander made several attempts to open and release the cockpit door without success. The cabin roof had sustained a large rift which resulted in fuel from the wings entering the cabin. A fire on the aircraft's right side spread into the cabin and over to the aircraft's left side. Three passengers and the forward cabin crew member were killed. The remaining nine passengers and the rear cabin crew member managed to evacuate the aircraft from the aircraft's rear left emergency exit by jumping to the ground and passing the engine that was still running. Six people sustained serious burns.

The preconditions for normal retardation of a BAe146 after landing are that the lift spoilers and brakes work. The primary purpose of lift spoilers is to reduce the remaining lift of the wings. This in turn transfers weight to the undercarriage, allowing the main wheels to grip the runway and the brakes to take effect. The aircraft type is not equipped with the possibility of reversing thrust. AIBN investigations indicate that the aircraft's tail air brake worked normal. This provided limited aerodynamic braking while the speed was still relatively high.

The aircraft type has two independent hydraulic systems that are used for the operation of lift spoilers and brakes, among other things. The aircraft type has a total of six lift spoilers. The "green" hydraulic system operates the outer and middle spoilers and the "yellow" hydraulic system operates the inner spoilers. The lift spoilers are electronically controlled.

The AIBN has not yet determined why the aircraft's lift spoilers were not deployed. The two hydraulic systems and signals from independent electrical circuits entail that the lift spoiler system originally has redundancy. The AIBN has focused particularly on areas where one failure may cause the system to malfunction. However, this task is demanding because most of these areas are burned-out.

The aircraft's six lift spoiler actuators on the wings had sustained serious damage from the fire. It was nevertheless possible to verify that all were in the folded and locked position.

In accordance with European regulations, aircraft of the relevant category should normally be able to stop within 60% of the available landing distance. The remaining 40% is intended to be a safety margin. According to the manufacturer's approved documentation, it is to be expected that the landing distance would increase by 40% if all lift spoilers were inoperative. The AIBN has calculated that under the prevailing conditions OY-CRG should have stopped around 100 metres before the end of the runway.

The aircraft's undercarriage has been thoroughly examined by the AIBN. A number of fragments of "boiled" rubber were found on the runway. Further, a tyre showed clear indications of so-called "rubber reversal" which occurs when a cushion of steam forms and the rubber is "boiled" under the tyres.

The AIBN has succeeded in retrieving data from the aircraft's cockpit voice recorder. The cockpit voice recorder contained normal quality information from the start in Stavanger until the accident at Stord. However, the aircraft's flight data recorder was so damaged by the fire that only short sequences could be deciphered. One of the sequences contained approximately 3 seconds of data from when the aircraft was close to the end of the runway. The AIBN also has data from the air traffic control service radars in Stavanger and Bergen. The radar data shows the aircraft's position, altitudes and speeds up until the landing at Stord. The radar data and the correspondence between the air traffic control service and the crew do not indicate anything out of the ordinary prior to landing.

According to the loadsheet, OY-CRG landed with a weight of 33,557 kg (of which 7,620 kg was fuel). This is 3,183 kg below the structural limitations for landing. The company's approved "Route Performance Manual" shows that when landing at Stord runway 33 with a 5 knot tailwind and with flaps at 33°, the aircraft can operate with a landing weight of 33,951 kg if the runway is dry. The limit is 28,112 kg if the runway is wet. As previously mentioned, the investigations of the AIBN have shown that the runway was damp. It is not usual to calculate a reduction in maximum landing weight if the runway is slightly damp/damp. The runway surface at Sørstokken was not grooved.

The AIBN investigation indicates that the touchdown point and landing speed were normal.

During the period of 15-25 September 2006 OY-CRG underwent planned maintenance (C12 (B4)) with Malmø Aviation. The aircraft then flew 78 hours and performed 41 landings without technical remarks. The aircraft had later undergone other less comprehensive maintenance. No problems with the aircraft's lift spoiler system had been reported.

The Civil Aviation Authority, Det Norske Veritas (DNV) and the Norwegian Public Roads Administration have carried out various inspections at Stord airport Sørstokken in recent years. AIBN is of the opinion that there is nothing in the reports that could explain why OY-CRG failed to stop on the runway.

AIBN has obtained reports of other comparable incidents with the BAe146-/RJ series aircraft type. Several of them are of interest, but so far in the investigation they have yet to provide an explanation for why the lift spoilers were not deployed in the case of the OY-CRG accident.

Significant results of the investigation

- None of the aircraft's six lift spoilers deployed after landing
- During rollout a cushion of steam formed under the main wheels and the tyre rubber was "boiled"
- The accident had fatal consequences due to burning fuel entering the cabin

The AIBN's further investigations will, among other things, consist of expert analysis of sounds in the cockpit of OY-CRG compared to other recordings from corresponding aircraft. Further, the AIBN will continue in-depth investigations of the hydraulic/electric design of the aircraft type's lift spoiler system in combination with the braking system.

STATUS RECOMMENDATIONS

The AIBN investigations have so far not uncovered circumstances that indicate a need to issue immediate safety recommendations.

The investigation will continue.