Federal Public Service
Mobility and Transport
Air Accident Investigation Unit

# Interim Safety Investigation Report

Ref. AAIU-2012-09

**Date and hour:** 19 April 2012 at 17:35 UTC

**Aircraft:** BAe Avro RJ100

**Incident location:** In Amsterdam Upper Control Area above FL245, Delta sector

**Aircraft owner:** Brussels Airlines SA/NV

**Type of flight:** Commercial pax transport

**Phase:** Initial Climb

**Persons on board:** 84

**Abstract:**

The aircraft with call sign BEL2YB took off at 17:20 UTC at Brussels for a scheduled flight to Stockholm, Broma. After 15 minutes, the crew got a master caution with both white and amber pressurization caption on the central warning panel (CWP). As per checklist, the crew switched to manual control for pressurization. Maastricht UAC was contacted to report pressurization problem and to request a descent. Initial clearance was given to descend to FL 260. After the pilots insisted to descend further, Maastricht UAC cleared BEL2YB to descend to FL250, whereupon the pilots insisted again to go lower. The cabin altitude passed 9000ft and kept climbing. Because they didn't get a clearance immediately, the pilots declared a mayday. Further descent to FL100 with radar vectors was given. Around that time the cabin hi altitude warning horn went off. Flight crew put on oxygen masks and alarmed the cabin crew for an emergency descent. At FL100 the aircraft levelled off and returned back to Brussels. After the passengers disembarked, the aircraft was moved to the hangar and pressurized as per maintenance manual. During this pressurization test a major leak revealed a crack with a length of 1089 mm in the LH aft fuselage skin. In addition to the skin crack, cracks were found in frames 41X and 42.

**Cause(s)**:

The cause of the incident was a crack of 1089 mm in the LH aft lower skin panel located in the lap joint area below the aft toilet servicing door. The fracture was due to multiple origin fatigue crack propagation which initiated in the chemical etched channel on the external surface of the skin panel.

**Hazard identified during the investigation** [1]:

Structural weakness not covered by existing fatigue inspections.

**Consequence** [2]:

Component failure non-powerplant (SCF-NP)

[1] Hazard – Condition or object with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.

[2] Consequence – Potential outcome(s) of the hazard

**Safety actions**

On June 13, 2013, BAe Systems issued inspections service bulletin 53-239 which asks

- to inspect the aft fuselage skin panels at stringer 30, left and right, between frame 39Y and frame 44 with an internal low frequency eddy current inspection;
- to perform a detailed visual inspection of frames 41, 41X, 42 and 43, left and right from stringer 29 to stringer 31 inclusive.

This SB was mandated by EASA AD 2012-0178 which was issued on 07 September 2012 and became effective on 21 September 2012. This AD required to perform the inspections described in the SB

- within 1000 FC or 6 months (whichever occurs first) for aeroplanes accumulated 9000 FC or more;
- before exceeding 10000 total flight cycles for aeroplanes accumulated less than 9000 FC.

Following the issuing of that AD, some new information, on additional damage found on this aircraft has resulted in a further review. This concluded that the compliance time had to be reduced in order to mitigate the risk of cracking on other aeroplanes. For that reason EASA AD 2012-0178 was superseded by EASA AD 2012-0184 on 12 September 2012. This AD requires to perform the inspections within a reduced period for aeroplanes that have accumulated 9000 FC or more. The inspections now had to be done within 1000 FC or 1 month (instead of the initial 6), whichevers occurs first.

AAIU(be) supports these actions and has no further recommendations towards BAe Systems.

**Progress of investigation**

AAIU (Be) has gathered all operational and engineering information and is finalizing the investigation. A full investigation report will be published within the next months.

## About this interim report

*As per Annex 13 and EU regulation EU 996/2010, it is obliged to perform a full investigation of accidents and serious incidents involving aircraft other than specified in Annex II to Regulation (EC) No 216/2008. Each safety investigation shall be concluded with a report in a form appropriate to the type and seriousness of the accident or serious incident. If the final report cannot be made public within 12 months, the safety investigation authority shall release an interim statement at least at each anniversary of the accident or serious incident, detailing the progress of the investigation and any safety issues raised.*

*It is not the purpose of the Air Accident Investigation Unit to apportion blame or liability. The sole objective of the investigation and the reports produced is the determination of the causes, and, where appropriate define recommendations in order to prevent future accidents and incidents.*