

Incident / Accident Investigation Report Form

Esemény üzemeltetői vizsgálati jelentés

I.a.w. the requirements of 13/2000. (V.31.) KHVM-HM-EüM Joint Decree of the Republic of Hungary (about the rules of professional investigation of aviation accidents and incidents)
A 13/2000. KHVM-HM-EüM rendelet előírásai szerint.

Report No.: 02/2005

Jelentés száma:

A/C Operator: FARNAIR Hungary Kft.

Repülőgép üzemeltetője:

A/C Manufacturer: LET

Repülőgép gyártója:

A/C Type: L 410 UVP-E

Repülőgép típusa:

A/C Nationality: Hungarian

Repülőgép nemzetisége:

A/C Registration: HA-LAE

Repülőgép lajstromjele:

Occurrence: Incident

Esemény:

Occurrence date BUD 08:03 LT 21/APR/2005

and location:

Esemény dátuma és helye

Incident / Accident Report Form No.: 02/2005

Esemény / Baleset Bejelentő Nyomtatvány száma:

Composition of Investigation Team:

Repülőesemény vizsgáló bizottság összetétele:

Levente Varga, Flight Safety Officer of FARNAIR Hungary

Short Overview of Event and Actions Taken:

Az esemény és a fogatosított intézkedések rövid áttekintése:

On 21/APR/2005 flight FAH6992 departed normally from BUD/LHBP airport bound to BBU/LRBS. During climb in icing cloud and windshield heating on, working in 2nd stage, L/H windshield decolorisation (electrical heating element problem) was observed. Heating was switched back to stage 1st. The windshield heating still consumed two high electric energy, so was switched off after levelling out. After appr. 4 minutes, the windshield was cracked (some outer layers of the multilayer windshield have cracked). The aircraft had to return to home base, BUD airport for defect rectification. No further discrepancy was observed during return.

Short summary of possible causes:

Az esemény okainak rövid összefoglalása:

Both the heating system defect and the incorrect heating procedure following were ruled out during the investigation of the incident. Only the ageing of the windshield heating elements and the windshield itself can be the explanation to the defect caused.

1. Facts / Ténybeli Információk

1.1. Description of Flight / A repülés lefolyása

On 21/APR/2005 flight FAH6992 departed normally from BUD/LHBP airport bound to BBU/LRBS as the normal daily operation. The crew did not observed or reported any defects or unserviceabilities during the start of the morning operation. They have taken off i.a.w. plans and standard procedures and started to climb i.a.w. ATC instructions. Windshield heating was on. During climb in icing cloud and windshield heating was switched and, working in 2nd stage, L/H windshield decolorisation (electrical heating element problem) was observed. Heating was switched back to stage 1st. The windshield heating still consumed two high electric energy, so was switched off after levelling out. After approximately 4 minutes after switching off, the windshield was visibly cracked (some outer layers of the multilayer windshield have cracked). The aircraft had to return to home base, BUD airport for

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defect rectification. Although the cracking did not caused any disintegration problem of the windshield, the return was performed with decreased airspeed for safety reasons. No further discrepancy was observed during the return to BUD.

1.2. Personal Injuries / Személyi sérülések

None.

1.3. A/C Damage / A légi jármű rongálódása

L/H windshield became U/S and had to be replaced.

1.4. Other Damages / Egyéb kár

None.

1.5. Flight Crew Data / A személyzet adatai

The commander of the flight on the given date was a 41 years old L410 commander, Hungarian citizen, working permanently for FAH. He had valid ATPL Licence with proper type rating for the type. His medical certification was also valid on the given date. The F/O of the flight on the given date was a 31 years old L410 F/O, Hungarian citizen, working permanently for FAH. He had valid ATPL Licence with proper type rating for the type. His medical certification was also valid on the given date.

1.6. A/C Data / A légi jármű adatai

A/C registered as HA-LAE is in permanent FAH operation and maintenance since many years. The aircraft was in serviceable condition in the morning of the incident. No windshield heating problem was observed on the earlier days. However, 7 days earlier, the R/H windshield was also cracked (not in use, on the ground, between two flights) showing also signs of cracking due to heating element problem. At that time, during the replacement of the R/H windshield, the windshield heating system was examined in detail, and turned out to be serviceable, no defect was found.

1.7. Meteorological Data / Meteorológiai adatok

Meteorological conditions were suitable for the planned flight on the day of the event. Icing conditions during climb in cloud indicated the necessity of windshield heating.

1.8. NAV Equipment / Navigációs berendezések

Were functioning properly. The incident has no connection related NAV equipment functionality.

1.9. Communication / Összeköttetés

Communication with ATC and Home base was reported normal and uneventfull during the whole flight.

1.10. Airport Data / Repülőtéri adatok

Departure and returning airport BUD/LHBP. There were no remarkable aspects of the event related to the airport itself. Not applicable for the incident.

1.11. Flight Data Recorders / Légi jármű adatrögzítők

The analyses of FDRs were not found to be necessary during the assessment of the event, since not containing data related to windshield heating.

1.12. Impact and Wreckage Data / A roncsra és a becsapódásra vonatkozó adatok

None.

1.13. Medical Data / Orvosi és igazságügyi-orvosszakértői adatok

Both crewmember had valid medical certificates during the event. Otherwise, there is no other remarkable medical aspect of the incident.

1.14. Fire / Tűz

None.

1.15. Survival Possibilities / A túlélés lehetősége

Not applicable.

1.16. Experiments and Tests / Próbák és kísérletek

None.

1.17. Description of other Services and Organizations / A szervezetek jellemzése

Not applicable.

1.18. Additional Information / Kiegészítő adatok

None.

1.19. Effective Investigation Techniques / Hasznos kivizsgálási módszerek

Nothing remarkable.

2. Analysis / Elemzés

The aircraft had faced windshield cracking due to heating days before the incident, on the other (R/H) windshield. That was replaced with a new, serviceable one. The windshield heating system was examined at that time in detail and also after this incident and was no malfunction, defect was identified. Thus it can be assumed, that heating system defect can be ruled out. There is a special requirement in the aircraft Aircraft Flight Manual and also in the Aircraft Maintenance Manual allowing the windshield system to be switched to Stage II. heating only after the minimum of 7 minutes spent after switching the windshield heating ON, to Stage I. This requirement should protect windshield too fast heating. The crew of the aircraft has reported that followed this procedure correctly, since the heating was switched ON, to Stage I. before taxiing out (~05:30UTC) and to Stage II. only long minutes after that (~06:00UTC). This should rule out windshield overheating due to incorrect procedure following. The decolorisation of the windshield must have been caused by the heating element failure (short circuit + damage between the windshield layers). The final cracking must have been caused by the effect of the damage done by the heating element short circuit, with the added temperature effect of the windshield (layers) cooling down after switching the heating OFF.

Since no other cause can be identified for the repeating windshield crackings, only the ageing of the windshields (i.e.: heating elements laminated between the windshield glass layers), plus the effect of the extensive windshield heating usage during the winter months can explain the defect.

3. Conclusions / Következtetések

Both the heating system defect and the incorrect heating procedure following were ruled out during the investigation of the incident. Only the ageing of the windshield heating elements and the windshields themselves can be the explanation to the defect caused.

4. Flight Safety Recommendations / Biztonsági ajánlások

None.

5. Appendices / Függelékek

None.

Date of Report Completion / A jelentés lezárásának időpontja:

22/JUL/2005

Signatures of Investigation Team Members / A bizottság tagjainak aláírása:

