



KÖZLEKEDÉSBIZTONSÁGI  
SZERVEZET  
TRANSPORTATION SAFETY  
BUREAU

# **FINAL REPORT**

**2007-196-4**

**Serious Incident**

**Budapest-Ferihegy**

**16th May 2007**

**AIRBUS INDUSTRIES A-320  
HA-LPA**

The sole objective of the technical investigation is to reveal the causes and circumstances of aviation accidents, incidents or irregularities and to initiate the necessary technical measures and make recommendations in order to prevent similar cases in the future. It is not the purpose of this activity to investigate or apportion blame or liability.

## **The present investigation was carried out by the Transportation Safety Bureau of Hungary on the basis of**

- Act XCVII of 1995 on aviation,
- Annex 13 identified in the Appendix of Act XLVI. of 2007 on the declaration of the annexes of the Convention on International Civil Aviation signed in Chicago on 7th December 1944,
- Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbvt.),
- MET Decree 123/2005 (XII. 29.) on the regulations of the technical investigation of aviation accidents, incidents and irregularities;
- In absence of other related regulation of the Kbvt., in accordance with Act CXL of 2004 on the general rules of administrative authority procedure and service.

The Kbvt. and the MET Decree 123/2005 (XII. 29.) jointly serve the compliance with the following EU acts:

- a) Council Directive 94/56/EC of 21 November 1994 establishing the fundamental principles governing the investigation of civil aviation accidents and incidents,
- b) Directive 2003/42/EC of the European Parliament and of the Council of 13 June 2003 on occurrence reporting in civil aviation.

The competence of the Transportation Safety Bureau of Hungary is based on Government Decree 278/2006 (XII. 23.).

## **Under the aforementioned regulations**

- The Transportation Safety Bureau of Hungary shall investigate the aviation accidents and the serious aviation incidents.
- The Transportation Safety Bureau of Hungary may investigate aviation incidents and irregularities which - in its judgement - would have resulted in accidents under other circumstances.
- The technical investigation is independent of any administrative, infringement or criminal procedures initiated in connection with the transport accident or incident
- In addition to the aforementioned laws, throughout the technical investigation ICAO DOC 6920 and 9756 Manual of Aircraft Accident Investigation are applicable.
- The present final report shall not be binding, nor shall an appeal be lodged against it.

No conflict of interest has arisen in connection with any member of the investigating committee. Persons participating in the technical investigation shall not act as experts in other procedures concerning the same case.

The IC shall safe keep the data having come to their knowledge in the course of the technical investigation. Furthermore the IC shall not be obliged to make the data – regarding which its owner could have refused the disclosure of the data pursuant to the relevant act – available to other authorities.

**The present final report**

was completed based on the draft report compiled by the IC and approved by the Director-General of TSB and sent to the concerned parties and organisations – defined by law – for reflections.

The organisations concerned accepted the content of the draft final report, no complementary suggestions were received.

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## DEFINITIONS AND ABBREVIATIONS

CAA	Civil Aviation Authority (until 31 December 2005)
ECAM	Electronic Centralized Aircraft Monitoring
FL	Flight Level
IC	Investigating Committee
ICAO	International Civil Aviation Organization
Kbvt.	Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents
LHTB	Lufthansa Technik Budapest
MAA	Military Aviation Authority
MCTW	Ministry of Transport, Communications and Water (Közlekedési, Hírközlési és Vízügyi Minisztérium, KHVM)
MET	Ministry of Economy and Transport (Gazdasági és Közlekedési Minisztérium, GKM)
NTA AD	National Transport Authority, Aviation Directorate
NTA CAD	National Transport Authority Civil Aviation Directorate (until 30 June 2007)
PSI	Pound per Square Inch
PSU	Passenger Service Unit
TSB	Transportation Safety Bureau

## BRIEF DESCRIPTION OF THE OCCURENCE

<b>Occurrence category</b>		Serious incident
<b>Aircraft</b>	<b>Manufacturer</b>	AIRBUS INDUSTRIES
	<b>Type</b>	A 320-230
	<b>Registration</b>	HA-LPA
	<b>Serial number</b>	839
	<b>Owner</b>	WIZZ AIR HUNGARY Ltd.
	<b>Operator</b>	WIZZ AIR HUNGARY Ltd.
	<b>Lessee</b>	None
<b>Occurrence</b>	<b>Date and time</b>	16 May 2007, 22:13
	<b>Location</b>	Budapest-Ferihegy
<b>Number of injured persons</b>	<b>fatal</b>	0
	<b>serious</b>	0
<b>Aircraft damage</b>		Not damaged
<b>State of registry</b>		Republic of Hungary
<b>Registering authority</b>		National Transport Authority Civil Aviation Directorate – NTA CAD
<b>Authority supervising manufacturing</b>		Direction Générale de l'Aviation Civile
<b>Competent investigating organization</b>		<b>TSB</b>

### Reports and notifications

The occurrence was reported to the TSB officer on duty at 22:18, 16<sup>th</sup> May 2007 by the personnel on duty at Budapest Airport Zrt.

### **The TSB officer on duty**

- reported to the head TSB officer on duty at 22:21, 16<sup>th</sup> May 2007, and
- notified the NTA CAD officer on duty at 22:25, 16<sup>th</sup> May 2007.

### Investigating Committee

On 28<sup>th</sup> May 2007, the Director-General of the TSB assigned the following investigating committee (hereinafter referred to as IC) to the investigation of the serious incident:

Investigator-in-Charge	János HORVÁTH	investigator
Member	László STORCZER	investigator

### Overview of the investigation process

The serious incident happened at 22:13, 16<sup>th</sup> May 2007 in Budapest FIR airspace, and the crew, by professional conduct, carried out a successful emergency landing at Budapest-Ferihegy airport, while the aircraft did not get damaged and the failure having caused the interruption of the flight was corrected on 17<sup>th</sup> May 2007, thus, field inspection was not executed immediately. Investigation of the scene and data collection was carried out during the repair activities.

During the investigation, an excellent cooperative environment has evolved between the employees of Lufthansa Technik Budapest (hereafter to be referred to as LHTB), WIZZ AIR HUNGARY Ltd., the French investigative body (BEA) and the employees of TSB participating in the investigation.

**A short summary of the occurrence**

On 16<sup>th</sup> May 2007, on the ECAM display of the AIRBUS A320 type airplane of WIZZ AIR airlines, registered HA-LPA, executing flight WIZZ285B (Budapest – Timisoara) the warning message “Cabin Pressure – Excessive Altitude” came on. The crew decided to return to Budapest. It turned around after emergency descent, and carried out a safe emergency landing in Ferihegy. Troubleshooting and repair was carried out by LHTB.

## 1. FACTUAL INFORMATION

### 1.1 History of the flight

On 16<sup>th</sup> May 2007, at 22:13 (local time) in the area of Budapest FIR, the scheduled flight with flight number WIZZ285B of WIZZ AIR airlines (Budapest – Timisoara) with 105 passengers and a crew of 6 on board, interrupted its flight on FL 285 (28500 feet) at phase 6 of flight when the warning message “CABIN PRESSURE – EXCESSIVE ALTITUDE” had been displayed on ECAM. The crew interrupted the planned further climb, and after the emergency descent, decided to return to Budapest. The aircraft descended to FL100, and carried out a safe emergency landing at Budapest – Ferihegy airport. The personnel did not need to use on-board oxygen, and it was not an overweight landing.

Troubleshooting and repair was carried out by LHTB. After repair, there was no decompression observed during the test flight on 17<sup>th</sup> May 2007. Following this, the aircraft was declared airworthy.

### 1.2 Personal injuries

Injuries	Crew		Passengers	Other
	Cockpit	Cabin		
Fatal	0	0	0	0
Serious	0	0	0	0
Minor	0	0	0	0
None	2	4	105	0

### 1.3 Damage to aircraft

The incident did not cause financially relevant damage in the given aircraft.

### 1.4 Other damage

The IC did not receive any information on further damage by the completion of the investigation.

### 1.5 Information on the personnel

#### 1.5.1 Commander of the aircraft

<b>Age, gender</b>		38 year old man
<b>Licence data</b>	<b>Professional valid until</b>	31th March 2008
	<b>Medical valid until</b>	3 <sup>rd</sup> March 2008
	<b>Certificates</b>	ATPL
	<b>Ratings</b>	A320
<b>Hours flown on the given type</b>		2393 hours

## 1.5.2 First officer

<b>Age, gender</b>		30 year old man
<b>Licence data</b>	<b>Professional valid until</b>	31 <sup>st</sup> March 2008
	<b>Medical valid until</b>	3 <sup>rd</sup> August 2008
	<b>Certificates</b>	ATPL
	<b>Ratings</b>	A320
<b>On the given type, in total</b>		1903 hours

## 1.6 Data of the aircraft

### 1.6.1 Airworthiness certificate valid until: 29<sup>th</sup> May 2007

### 1.6.2 General

	<b>Hours flown</b>	<b>Number of landings</b>
<b>Since manufacture</b>	23573 hours	17858
<b>Since last overhaul</b>	-	-
<b>Since last maintenance</b>	0.5	1

### 1.6.3 Aircraft engine data

	<b>Left engine (N° 1)</b>	<b>Right engine (N° 2)</b>
<b>Type</b>	V2500	V2500
<b>Serial number</b>	V12145	V11118
<b>Hours flown</b>	4163.29	14509.29
<b>Cycles</b>	2632	8896

### 1.6.4 Data of the failed equipment

The IC is not aware about a failed equipment. The incident was not caused by the failure of an equipment or other aircraft component mounted on the aircraft.

### 1.6.5 Aircraft loading data

The aircraft loading data had no effect on the course of events, therefore their analysis was not required.

## 1.7 Meteorological data

The meteorological conditions had no effect on the course of events, their analysis was not required.

## 1.8 Aids to navigation

The equipment recorded in the type certificate were installed onto the aircraft, they functioned normally.

The ground based equipment operated in accordance with the requirements, they were capable of fulfilling their given task.

The navigational instruments had no effect on the course of events therefore their analysis was not required.



## **1.9 Aids to navigation**

The equipment recorded in the type certificate were installed onto the aircraft, they functioned normally.

The ground based equipment operated in accordance with the requirements, they were capable of fulfilling their given task.

The instruments of communication had no effect on the course of events therefore their analysis was not required.

## **1.10 Aerodrome information**

The airport concerned (Budapest – Ferihegy) disposed of a valid operating licence.

The parameters of the aerodrome had no effect on the course of events therefore their analysis was not required.

## **1.11 Flight recorders**

Regarding the equipment of air traffic control and the aircraft, the required flight recorders were operative and the data recorded by them were usable.

The aircraft was equipped with the flight recorders indicated in the type certificate. They functioned in accordance with the requirements.

## **1.12 Wreckage and impact information**

The incident did not result in a wreckage.

## **1.13 Data of the medical investigations**

There are no data available about the psychophysical state of the crew before and during the flight.

### **Medical forensics examination**

There was no medical forensics examination.

## **1.14 Fire**

There was no fire.

## **1.15 Chances of survival**

There was no mortal danger during the occurrence.

There were no personal injuries.

## **1.16 Tests and research**

Tests and researches were not initiated by the IC.

## **1.17 Organisational and management information**

Inaccurate replacement of the rubber sealing on the forward cargo compartment door during LHTB maintenance has to be regarded as a direct cause of the incident. However, the cooperation between TSB and LHTB was exemplary, both in the way how the consequences from the deficient work had been handled and also by making available the documentation necessary for the investigation. WIZZ AIR also contributed extensively to the success of the investigation.

### **1.18 Additional information**

The IC does not find any other data than the factual data described above relevant to making the conclusions and developing the safety recommendations.

### **1.19 Useful or effective investigation techniques**

The investigation did not require techniques differing from the traditional approach.

## 2. ANALYSIS

The on-board and maintenance documentations from the period before the incident were studied and analysed during data collection induced by the incident. The Investigative Committee found technical documentation that can be linked to the incident.

A 2C planned maintenance (due after 6000 hours flown / after 4500 cycles or by reaching 20 months of operation time) was carried out on the aircraft concerned at the maintenance base LHTB, in the period between 5<sup>th</sup> May 2007 and 16<sup>th</sup> May 2007 before starting the flight WIZZ285B. On 5<sup>th</sup> May 2007, during maintenance, the defect of the seal on the forward cargo door was documented on Defect Order No. 5071135-0010: "FWD CARGO DOOR SEAL DEFECT, FWD CARGO DOOR PRESSURE SEAL IS WEAR".

The damaged seal was replaced and in line with the work procedures of the maintenance organization, the job was concluded and documented after double checking. During maintenance such an extensive structural dismantling was carried out; i.e. the stabilizer was dismantled and then readjusted on both sides, which incited LHTB to recommend to WIZZ AIR as the client to carry out a test flight before issuing the Certificate of Release to Service (CRS 144). WIZZ AIR did not attach the release of CRS to a test flight, thus the maintenance organization handed over the aircraft to the airline along with the closed down documentations necessary for operation. Having taken over the aircraft, the airline put the airplane to service the same day.

The first flight of the aircraft was between Budapest and Timisoara. After take-off, on FL285, parallel with the warning message coming on on the ECAM display, the crew perceived a critical cabin altitude, close to FL110 (3353 m).

Below FL95 the display is green, on an altitude above this it becomes red, indicating to the crew that the cabin altitude is high (the pressure in the cabin is equivalent to the atmospheric pressure belonging to this altitude). Considering the different physiological characteristics of the passengers, the crew has to decrease the cabin altitude immediately, i.e. the pressure in the cabin is to be increased. This could be attained by the crew in the given case only by descent.

Comment:

Cabin altitude was below the critical FL140 (it is at this altitude where oxygen masks providing individual oxygen supply are automatically deployed from the passenger service unit).

Loss of cabin pressure happened, even though the cabin pressure regulator valve was closed. After emergency descent, the aircraft landed safely in an emergency landing at Ferihegy.

After downloading the MAINTENANCE POST FLIGHT REPORT (recorded failures) of the aircraft's ECAM WARNING MESSAGES on 17<sup>th</sup> May 2007, the personnel of LHTB identified the failure message in the 6<sup>th</sup> phase of the flight indicated by the crew of the aircraft, and printed the recorded data.

During the troubleshooting and checking of the cabin pressure regulator system the computers connected to the regulator system and their connections were checked, but no failure was detected.

Since fault detection in the electronic systems was fruitless, a pressure test was carried out. Overpressure was created with air bled from the auxiliary power unit (APU). The

examination brought positive results, since a blowout noise was perceived by the technical staff from the upper corners of the sealing of the forward cargo door.

The blowout was caused by the inaccurate repair of the mentioned sealing fault (replacement due to wearing) observed on 5<sup>th</sup> May 2007, which was not followed by a leak test. Section 52-31-18 of the Aircraft Maintenance Manual (AMM) of the manufacturer does not require a pressure test after work carried out on the sealing.

After fault detection, the previously replaced sealing was repositioned and the piano hinge stabilizing the door was also slightly adjusted.

Considering the fact that the operator did not ask for a test flight after the 2C maintenance and the aircraft could not execute its first flight due to a technical failure, the operator decided that a test flight is necessary after repair.

After discussion with WIZZ AIR, the test flight was carried out in the presence of the TSB investigators.

The crew started the leak test of the cabin at FL310. At an altitude kept stable for 1 minute the displayed parameters showed normal operational conditions, i.e.

- cabin vertical speed: 0 feet/sec
- differential pressure values: normal operational value: 6.5 PSI (maximum value 8.5 PSI)
- cabin altitude: FL58 (1768 m) (critical value: above FL95)

These parameters were displayed by the aircraft with the bleed air control pack valve in the open position.

In the test flight the aircraft operated without fault. After landing in Ferihegy, as based on the experiences of the test flight, the aircraft was declared airworthy by LHTB.

During the investigation of the incident, TSB wondered why the depressurization caused by the partly inaccurate mounting of the cargo door seal could not be prevented by the closed bleed valve in case of the airplane type A320 of WIZZ AIR, which disposes of engines of the V2500 type. To clarify beyond doubt the reasons behind the decompression taking place slowly, but converging to the critical value, TSB contacted the competent departments of AIRBUS and WIZZ AIR (as the operator). This yielded reassuring results: the representative of the AIRBUS sent the TSB the final report from a similar incident and a relevant SERVICE INFORMATION LETTER-t (S.I.L. 21-30) issued previously by the manufacturer. According to the documents, the inaccurate mounting of the sealing of the cargo compartment (and in general, the doors) may lead to such a degree of decompression, which may trigger the incident investigated.

### **3. CONCLUSIONS**

#### **3.1 Factual findings that can be directly linked to the occurrence:**

The damaged rubber sealing on the forward cargo compartment door was not replaced in accordance with the technological recommendations of the manufacturer in the 2C maintenance.

### **4. SAFETY RECOMMENDATIONS**

Similar occurrences can be prevented by adhering to the existing rules and regulations, therefore a safety recommendation is not to be issued.

### **5. APPENDICES**

The final report does not contain appendices.

Budapest, 12. October 2009

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János HORVÁTH  
Investigator-in-Charge

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László STORCZER  
Member of the IC

#### **NOTE:**

*The present document is the translation of the Hungarian version of the final report. Although efforts have been made to translate it as accurately as possible, discrepancies may occur.  
In this case, the Hungarian is the authentic, official version.*