



**Final Report
of the Aircraft Accident
Investigation Bureau**

concerning the incident

of the airplane British Aerospace BA 146-300, OO-TAS

on 29 January 2001

at Geneva Airport, Switzerland

URSACHE

Der Zwischenfall ist auf Rauch im Cockpit zurückzuführen, der durch einen fehlerhaften Flat Panel Control Display Unit der Navigationsanlage verursacht wurde und zu einer Notlandung führte.

CAUSE

L'incident est dû à de la fumée dans le cockpit, qui a été provoquée par un Flat Panel Control Unit défectueux et qui a conduit à un atterrissage d'urgence.

FINAL REPORT (incident)

THIS REPORT HAS BEEN PREPARED FOR THE PURPOSE OF ACCIDENT/INCIDENT PREVENTION. THE LEGAL ASSESSMENT OF ACCIDENT/INCIDENT CAUSES AND CIRCUMSTANCES IS NO CONCERN OF THE INCIDENT INVESTIGATION (ARTICLE 24 OF THE AIR NAVIGATION LAW)

AIRCRAFT	British Aerospace BA 146-300	OO-TAS
OPERATOR	TNT Airways S.A. B-4460 Grâce-Hollogne	
OWNER	TNT Airways S.A. B-4460 Grâce-Hollogne	

PILOT (CMD)	British citizen, born 1962
LICENCE	ATPL (UK) and Belgian validation, valid.

FLIGHT EXPERIENCE

Total pilot hours	2780	In the previous 90 days	85.1
On the accident type	1510	In the previous 90 days	85.1

PLACE	Geneva Airport, Switzerland
DATE AND TIME	29. 01. 2001 23:23 UTC

TYPE OF OPERATION	Commercial cargo
PHASE OF FLIGHT	Cruise
TYPE OF INCIDENT	Smoke / fumes in cockpit

INJURIES TO PERSONS

	Crew	Passengers	Others
Fatal	---	---	---
Serious	---	---	---
Minor or none	2	---	---

DAMAGE TO AIRCRAFT	Heat damage on navigation CDU
OTHER DAMAGE	None

HISTORY OF THE FLIGHT

The flight departed Treviso (LIPH) at 21:54¹ destination Liege (EBLG). At approximately 22:50 UTC, during cruise at FL 280, the crew noticed a burning smell coming from the area of the glare shield. The intensity of the smell was increasing within 2-3 minutes still with no visible smoke.

The Commander (CMD) decided to adopt the emergency drill for smoke memory items.

A mayday call was issued to Reims control, which had to be repeated several times until the controller understood the message.

The CMD selected 7700 on the transponder and turned the aircraft 180° towards Geneva (GVA). There was no visible smoke but some haze present; the pilots were wearing their smoke masks without goggles.

During descent the aircraft entered icing conditions. At that stage the CMD decided that the severity of the smoke and the slow rate that it was increasing, was a situation that would be better coped with, with an autopilot and a full navigation system.

Carrying out the “electric smoke” drill would have severely disabled navigation capability.

However, the CMD was prepared to carry out the drill had the smoke increased.

The crew performed a normal descent profile and strait-in ILS approach on Runway 23, accepting a tail wind.

Geneva arrival and tower controllers also had considerable difficulties understanding transmissions from the aircraft.

A normal landing at 23:23 with maximum braking was carried out. The aircraft was stopped on the runway and the crew evacuated via the main door.

The pilots reported aching eyes.

FINDINGS

- The pilots held valid licences for this type of flight.
- The airplane was approved for commercial operation.
- Mass and centre of gravity were within limits.
- The crew experienced a strong electric smell/haze/fumes in the cockpit during cruise.
- The crew could not determine the source of the smell/fumes.
- The closest suitable airport for an emergency landing at that time of the night was Strasbourg at a distance of approx. 60 NM and Basle at approx. 75 NM from the position the decision to divert was made.

¹ All times in UTC

- The CMD choose GVA for the diversion at approx. 130 NM distance.
- The pilots used oxygen masks but did not wear smoke goggles.
- After donning oxygen masks the transmissions from the aircraft to air traffic control was very difficult.
- The crew landed the aircraft approx. 33 minutes after first perception of the smell.
- The investigation revealed that the back light inverter of the UNIVERSAL navigation system's Flat Panel Control Display Unit was at fault. The component manufacturer UNIVERSAL since issued a Service Bulletin (1117.XX-34-2699) including an Inverter Circuitry Integrity Test on 20 June 2001.

ANALYSIS

Operational Aspects

The crew could not localise the source of the smell / fumes.

Incidents and accidents in the past have shown that, in case of fire, the useful time to safely land the aircraft was 10 to 15 minutes.

The commander's decision to divert for an emergency landing was correct, however the choice to use GVA at a distance of 130 NM and a resulting flight time of 33 minutes is questionable. Basle or Strasbourg could have been reached within approx. 15 minutes had the situation turned out to be severe.

The descent and the approach led through icing conditions. The crew choose not to perform the "electric smoke" check list. Doing so would have hindered a speedy approach and landing in the prevailing conditions.

Wearing the smoke goggles could have prevented aching eyes.

Technical Aspects

The component manufacturer's investigation of the incident led to a service bulletin imposing procedures to determine the integrity of the unit. The AAIB considers that compliance to this service bulletin prevents further similar failures of the system.

After having donned the smoke masks the pilots experienced considerable difficulties communicating with air traffic control.

The smoke protection equipment in the cockpit should be tested regularly to ensure proper function in case of an emergency.

Smoke goggles rarely fit properly to give the required protection. State of the art equipment consists of full-face masks.

CAUSE

The incident was caused by fumes in the cockpit due to a faulty Flat Panel Control Display Unit of the navigation equipment, leading to an emergency diversion landing.

Berne, 25 May 2002

Aircraft accident investigation Bureau