

Today <4 March 2009>, the Dutch Safety Board has issued a warning for airline manufacturer Boeing and presents its initial findings regarding the terrible accident involving the Boeing 737/800, Turkish Airlines flight.

This accident claimed the lives on nine people (5 passengers and 4 crew) and 80 passengers were injured. Twenty eight of those injured are still hospitalised.

The Boeing was en route from Istanbul to Schiphol (on Wednesday 25 February 2009) and was due to land at Schiphol at 10.40.

The Boeing had had a regular flight and no problems had been experienced until just before the approach.

There were three people in the cockpit, the captain was located on the front, left hand side. On the right hand side there was the first officer, for whom this was a training flight. (The first officer had all appropriate qualifications). There was also an extra first officer in the centre of the cockpit.

The crew made contact with air traffic control (Amsterdam Radar) at 10.04 and was transferred to the tower at Schiphol - for the landing – at 10.14. The tower then gave the Boeing permission to land on the Polderbaan 18R.

The Polderbaan was approached according to fixed procedures, without any delay, and the Boeing was then given permission to decrease its altitude to 2000 feet (about 700 meters) and begin its descent to the Polderbaan.

This descent takes place with the help of the automatic pilot, as is normal with Turkish Airlines (this method can be utilised by everybody, as can a manual landing).

The voice recorder and the black box, both of which are in the hands of the Safety Board, show that an irregularity occurred during the descent, at 1950 feet.

At a height of 1950 feet the left radio altimeter suddenly indicated a change in altitude – from 1950 feet to - 8 feet - and passed this onto the automatic pilot. This change had a particular impact upon the automatic throttle system which provides more or less engine power.

The radio altimeter normally measures the altitude of the plane above the ground very accurately and can start registering this from 2500 feet. As already mentioned, this radio altimeter is very significant for providing the appropriate power for an automatic landing.

A Boeing is fitted with two radio altimeters, a left one and a right one.

The black box has shown that this deviation only occurred in the left radio altimeter.

The voice recorder has shown that the crew were notified that the left radio altimeter was not working correctly (via the warning signal “landing gear must go down”).

Provisional data indicates that this signal was not regarded to be a problem.

In practice, the plane responded to this sudden change as though it was at an altitude of just a few meters above the Polderbaan and engine power was reduced.

It seems that the automatic system – with its engines at reduced power – assumed it was in the final stages of the flight.

As a result, the aircraft lost speed.

Initially the crew did not react to the issues at hand.

As a result of the deceleration, the aircraft's speed was reduced to minimum flying speed (stalling situation) and warning signals (the steering column buzzes at an altitude of 150 metres) were given.

The black box shows that full power was then applied immediately. However, this was too late to recover the flight, the aircraft was too low and, consequently, the Boeing crashed 1 kilometre short of the runway.

The black box – which can register 25 hours of flying time and which, in this case, covered 8 flights - showed that this problem had occurred twice previously in a similar situation, before landing.

The aircraft initially hit the ground with its tail and then the undercarriage followed. The forward speed was about 175 km per hour upon impact. An aircraft of this weight should normally have a speed of 260 km per hour for landing.

The aircraft came to a rapid halt (after about 150 m) as a result of the arable land being made up of boggy clay.

The braking caused by the ground meant that the aircraft broke into two pieces; the tail broke off and the aircraft's hull ruptured at business class.

The landing gear broke off, in accordance with its design. This also applied to the two engines. The full power and the sudden braking resulted in both engines continuing forwards for a further 250 meters.

Most of the fatally wounded victims were located near the rupture, in business class, and the three crew members in the cockpit died as a result of the enormous braking forces, partially caused by the embedded nose-wheel and the forward movement of the aircraft.

The section that remained most intact was situated around the wings.

On board the plane there were 128 passengers and 7 crew, of whom 28 are still hospitalised.

The Board's investigation will now focus fully on the workings of the radio altimeters and the connection to the automatic throttle (automatic steering system).

Weather conditions, particularly visibility through the low cloud base and the mist, probably meant that the Polderbaan was not yet visible at the height at which the descent was commenced.

The Safety Board board will be assisted in its investigation and its attempts to ensure lessons are learnt by the following organisations:

- the National Transportation Safety Board
- Bureau d'Enquetes et d'Analyse (BEA)
- Aviation Accident Investigation Branche (AAIB)
- Directorate General of Civil Aviation (Turkse Rijksluchtvaartdienst, DGCA)
- Boeing
- Turkish Airlines
- The engine manufacturer, CFM

- Inspectie Verkeer en Waterstaat (IVW) [Traffic and Waterways Inspectorate]
- Federal Aviation Agency (FAA, American Civil Aviation Authority)
- Vereniging van Nederlandse verkeersvliegers [Association of Dutch Commercial Pilots]
- Nederlandse vereniging voor cabinepersoneel [Dutch Association for Cabin Personnel]

Internationally, both the ICAO and the EU stipulate that involved parties may take part in the Board's investigation (party system).

The investigation itself, however, is supervised by and remains the Board's responsibility.

The Board has also received a great deal of data from the Public Prosecutor for its investigation.

Furthermore, there have been content-based contributions from a great many police organisations. The National Police Force, particularly all staff from the National Team of Forensic Investigation who are responsible for the forensic work at the location itself, the Aviation Police, who took all the aviation photographs, and the National Traffic Assistance team who helped the Board to measure the location of the accident.

The Public Prosecutor took possession of the aircraft and, as a result, responsibility for guarding it lay entirely with them.

Police officers from all over the country were drafted in for this purpose.

We are extremely grateful for their outstanding and meticulous work and for guarding the aircraft.

There was a misunderstanding regarding the use of the data from the cockpit voice recorder and the flight recorder (black box).

It is established, in Dutch law, that the Public Prosecutor may only have access to this data if there is a question of abduction, terrorism, murder or manslaughter.

In such a situation, the Safety Board is also legally obliged to hand over this data to the Public Prosecutor.

In principle, there are two investigations being carried out into the accident.

- The judicial investigation.  
The search for punishable facts and the use of these to hold those responsible to account.
- The independent investigation.  
This investigation focuses fully on finding out what happened so that lessons can be learnt.

There is always some tension between the two investigations.

Within criminal law you may be silent.

Nobody needs to contribute to his or her sentence.

With the independent investigation, however, you want to ensure that everything is said.

For this reason, the reports from the Board may not be used as evidence in lawsuits.

From today onwards, the investigation by the Board will concentrate on two subjects:

The technical investigation will focus on the role of the automatic pilot, the automatic throttle system and the connection to the radio altimeter. <This will take place with the same involved parties>.

Alongside the aforementioned technical investigation, the focus will also be on the management of the crisis.

How was the disaster dealt with and what can be learnt from this.

This investigation will also focus on the passenger list.

The recovery of the wreckage will probably take place at the end of this week.

The aircraft will be taken to another location for – possible – further investigation.

The Board is of the opinion that extra attention is needed for the role of the radio altimeter when using the automatic pilot and the automatic throttle system. The Board has issued a warning for Boeing today requesting extra attention to a part of a manual for the Boeing 737, in which is stated that in case of malfunction of the radio altimeter(s), the automatic pilot and throttle system that are connected to this may not be used for approach and landing. The Board would like Boeing to consider an investigation into whether this procedure is also applicable during flight.

With the exception of the malfunction of the left radio altimeter the investigators of the Dutch Safety Board have not yet found any irregularities.