

## Synopsis

Kind of occurrence: Accident  
Date: 1 July 2002  
Location: (near) Ueberlingen/Lake of Constance/Germany  
Type of aircraft: Transport Aircraft  
Manufacturer/Model: 1. Boeing B757-200  
2. Tupolev TU154M  
Injuries to persons: 71 fatalities  
Damage to aircraft: Both aircraft destroyed  
Other damage: Damage to open field and forest  
Source of Information: BFU Investigation

The accident was notified to the German Federal Bureau of Aircraft Accidents Investigation (BFU) at 21:50 hrs on 1 July 2002. A witness standing outdoors in Ueberlingen reported the accident by phone. The witness had become aware of the collision of two transport aircraft through explosive sounds.

The investigation was initiated by the BFU as soon as the information proved to be correct. On 2 July 2002 six BFU staff members arrived at the accident site. Because the two airplanes were under control of ACC Zurich during the time of the accident two other BFU staff members flew to Zurich in order to conduct the necessary investigation in cooperation with the Swiss accident investigation authority (BFU - Büro für Flugunfalluntersuchungen).

The investigation was carried out in accordance with the international Standards and recommended Practices (SARPs) contained in ICAO Annex 13 and the German investigation law (FIUUG) under the responsibility of the BFU. The countries Kingdom of Bahrain, Russian Federation, Confoederatio Helvetica (Switzerland) and the USA were involved in the investigation through their Accredited Representatives and advisers. In the first phase of the investigation the investigation team worked simultaneously in a headquarter at the airport Friedrichshafen, at ACC Zurich, at the different accident sites in the area around the city of Ueberlingen and at the BFU in Braunschweig.

On 1 July 2002 at 21:35:32 hrs a collision between a Tupolev TU154M, which was on a flight from Moscow/ Russia to Barcelona/ Spain, and a Boeing B757-200, on a flight from Bergamo/Italy to Brussels/Belgium, occurred north of the city of Ueberlingen (Lake of Constance). Both aircraft flew according to IFR (Instrument Flight Rules) and were under control of ACC Zurich. After the collision both aircraft crashed into an area north of Ueberlingen. There were a total of 71 people on board of the two airplanes, none of which survived the crash.

The following immediate causes have been identified:

- The imminent separation infringement was not noticed by ATC in time. The instruction for the TU154M to descend was given at a time when the prescribed separation to the B757-200 could not be ensured anymore.
- The TU154M crew followed the ATC instruction to descend and continued to do so even after TCAS advised them to climb. This manoeuvre was performed contrary to the generated TCAS RA.

The following systemic causes have been identified:

- The integration of ACAS/TCAS II into the system aviation was insufficient and did not correspond in all points with the system philosophy.  
The regulations concerning ACAS/TCAS published by ICAO and as a result the regulations of national aviation authorities, operations and procedural instructions of the TCAS manufacturer and the operators were not standardised, incomplete and partially contradictory.
- Management and quality assurance of the air navigation service company did not ensure that during the night all open workstations were continuously staffed by controllers.
- Management and quality assurance of the air navigation service company tolerated for years that during times of low traffic flow at night only one controller worked and the other one retired to rest.