



MINISTRY OF DEFENCE
MILITARY AIRCRAFT ACCIDENT SUMMARY

AIRCRAFT ACCIDENT TO ROYAL AIR FORCE BULLDOG T1 XX666

DATE: 5 March 1999
PARENT UNIT: No 12 Air Experience Flight, RAF Leuchars
LOCATION OF ACCIDENT: RAF Leuchars
CREW: Two
CASUALTIES: Two Major

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Synopsis

1. Bulldog T1 XX666 was being flown on a Flying Ability Test (FAT) sortie when, shortly after take-off, an engine failure was simulated. The aircraft began a right hand turn back toward the airfield, but as it did so, it quickly started to lose height. The crew attempted to recover the aircraft but, in the height available, were unsuccessful and the aircraft made a heavy 'belly-landing' on to RAF Leuchars' grass airfield, to one side of the runway. Although both aircrew escaped from the aircraft unaided, they were later diagnosed as having sustained major back injuries.
2. The Board of Inquiry concluded that the accident was the result of the 'turnback manoeuvre' during which the aircraft was over-banked and a high rate of descent developed which was not recognised until there was insufficient height left to recover.

Background

3. On 5 March 1999, XX666's captain; the Officer Commanding 12 Air Experience Flight (AEF), was conducting a Flying Ability Test on a Volunteer Reserve Training (VR(T)) pilot from the same flight. Although both pilots were experienced aviators neither was familiar with the turnback manoeuvre.

Circumstances

4. The weather on the day of the accident was clear with scattered cloud at 2,200 feet and a 12 knot north westerly wind. Visibility was excellent. At 1005, after a normal start up, the aircraft took off, entering a steady climb. Shortly afterwards, at about 500 feet, the aircraft captain closed the throttle to simulate an engine failure. The VR(T) pilot banked the aircraft at 45° and began a right hand turn back toward the airfield. However, the aircraft's angle of bank continued to increase until it had reached 60° and very quickly the aircraft started to lose height.
5. The aircrew attempted to recover the situation but in the height available could only level the aircraft and partially slow its descent before it hit the ground. The impact removed the undercarriage sections leaving the aircraft to slide a further 31 metres before coming to a halt.

Aircraft Damage

6. XX666 was originally assessed to be repairable but a further inspection found that any repairs would need to be carried out by a specialist organisation. In view of the Bulldog's imminent departure from operational service, XX666 has not been repaired.

Investigation

7. The evidence available to the Board included statements from the two pilots, eyewitness accounts and analysis of XX666's wreckage. A detailed examination of the wreckage by a member of the Air Accidents Investigation Branch and an examination of the engine by CSE Aviation at Kidlington established that the aircraft had been fully serviceable at the moment of impact. The Board's investigation therefore concentrated on the crew's handling of the simulated engine failure.
8. The Board concluded that XX666's angle of bank had exceeded the prescribed limit of 45° with the result that the aircraft began to descend rapidly. The descent was not recognised and checked until there was insufficient height left to recover the aircraft. Several factors contributed to this, including both pilots' unfamiliarity with the turnback manoeuvre.

Safety Recommendations

9. The Board made a number of recommendations, including one to modify the Bulldog's seat to better cushion an impact with the ground. They also suggested a review of the reasons for and restrictions applied to practice turnback manoeuvres as well as an amendment to the Bulldog Aircrew Manual warning of the dangers of exceeding a 45° angle of bank during a turnback.

