

**MILITARY AIRCRAFT ACCIDENT SUMMARY**

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**AIRCRAFT ACCIDENT INVOLVING ROYAL AIR FORCE**

**HARRIER GR7 ZD432**

**Date:** 23 November 1993  
**Parent Station:** Royal Air Force, Laarbruch  
**Place of Accident:** Sirsenk, Northern Iraq  
**Crew:** 1 Pilot  
**Casualties:** 1 Minor

**CIRCUMSTANCES**

1. The pilot of a Harrier GR7 aircraft was tasked to carry out a routine reconnaissance mission in support of the United Nations mandate to police the no-fly zone of Northern Iraq. To complete the mission, it was necessary, first, to carry out air-to-air refuelling. The pilot of ZD432 flew as the No2 of the lead pair of a formation of six Harrier GR7s. He took off from Incirlik, Turkey, following the VC10K tanker aircraft, and climbed to the transit height of 25,000ft. After 45 minutes, the pilot of ZD432 was about to complete a final fuel top-up, when he heard a continuous series of rapid, loud bangs accompanied by a sharp deceleration. The aircraft disconnected from the refuelling drogue and quickly descended into cloud.

2. The pilot brought the throttle to idle and then selected a mid-range setting, assessing that his engine had surged. He then advanced the throttle, an action which was accompanied by an abnormal rise in the engine's Jet Pipe Temperature and by the activation of an audio alarm. Believing that the engine was still in surge, the pilot selected the High Pressure fuel cock to off, which shut down the engine. He made two relight attempts, descending through 22,500ft and 14,500ft respectively, both of which were unsuccessful. The pilot then started the Auxiliary Power Unit and, in an attempt to improve his gliding performance, jettisoned the external stores. At this stage, the aircraft was still in cloud and was approaching the Area Safety Altitude of 10,000ft. He broke clear of cloud at 10,100ft,

called on the radio that he was ejecting and arrested his rate of descent. A final relight attempt was again unsuccessful and the pilot ejected at 8,000ft above mean sea level (about 1,500ft above ground), sustaining minor injuries on landing. The aircraft crashed into a large rocky outcrop in a narrow valley and was destroyed.

### **CAUSE**

3. The cause of the accident was the engine's failure to relight successfully. Despite an extensive investigation, however, there was no conclusive technical explanation for the relight problems. On the other hand, it was confirmed that the cause of the initial surge was either an inadvertent or undemanded activation of the engine's Manual Fuel System (MFS). The MFS is fitted as a back-up to the aircraft's Digital Engine Control System and delivers fuel at a higher rate. The precise reason for the activation of the MFS could not, however, be ascertained. Analysis of the Accident Data Recorder revealed that, following the initial surge, the engine was still developing thrust, albeit under MFS control. The pilot had mistakenly believed that the engine was in surge and his decision to shut down a functioning engine unnecessarily, contributed to the accident.

### **SUBSEQUENT ACTIONS**

4. The Harrier flight simulator has been modified to better represent MFS characteristics. Engine emergencies at medium-level, in addition to those previously practised at low-level, have been introduced into Harrier flight simulator training requirements. In addition, all pilots at RAF Laarbruch have been re-briefed on engine handling.