



MINISTRY OF DEFENCE

Military Aircraft Accident Summaries

MAAS 6/85 / 1

12 April 1985

AIRCRAFT ACCIDENT INVOLVING JAGUAR T MK 2 XX915

Date: 17 January 1984
Parent Airfield: A & AEE Boscombe Down
Place: In open country about $\frac{3}{4}$ mile from the airfield boundary
Crew: One
Casualties: None

CIRCUMSTANCES

1. About 4 minutes after take off from Boscombe Down on a normal training flight the aircraft's No 1 hydraulic system gave indications of abnormal pressure fluctuations and possible impending failure. The pilot correctly decided to return to Boscombe Down, carrying out appropriate procedures for this defect. Whilst the aircraft was manoeuvring in the immediate area of the airfield preparatory to landing, the No 1 engine unexpectedly stopped as though the fuel had been turned off. At the time the aircraft's under-carriage was down and its flaps were partially extended, requiring reheat power on the live engine to maintain flight, and the pilot decided to land on the secondary, Northerly, runway. Shortly after reheat had been selected a major fire developed around the rear fuselage ultimately forcing the pilot to eject. The ejection was entirely successful, the pilot uninjured and the aircraft crashed on farmland.

2. Particular emphasis was placed during the investigation on analysing the aircraft's final flight path in relation to the Chemical Defence Establishment and the Centre for Applied Microbiology Research at Porton Down. The aircraft did not penetrate the Porton Down range area although its track passed close to some CAMR buildings albeit at between 500 ft and 600 ft above ground level. Due to the Westerly wind, the cockpit canopy, explosively separated during pilot ejection, landed on a married quarter some 160 m East of the aircraft track, and the pilot on a CDE building some 300 m East of track. The aircraft remained controllable until the point of ejection by which time the pilot had ensured that the aircraft was pointing into open farmland. There was thus little risk of hazard to the CDE or CAMR.

CAUSE

3. The aircraft was fully serviceable when it took off. At some stage in the flight a single HP turbine blade in the No 1 engine failed. Such a failure can lead to very intense but localised vibration of the engine which would not be perceptible to the pilot. Signs of internal damage to the engine driven hydraulic pump of the No 1 engine were compatible with this type of vibration but there was no evidence of a hydraulic leak. The main fuel input pipe to the engine's low pressure fuel pump was found to have suffered fatigue cracking, cause by vibration, around most of its circumference. This would lead to a severe fuel leak explaining the undemanded failure of the No 1 engine and it is probable that the fire was caus

SUBSEQUENT ACTION

4. The turbine blade failure resulted from fatigue originating from inter-granular chemical corrosion introduced during a repair procedure discontinued in 1978. All blades repaired under this procedure have been identified and withdrawn from service. It remains possible that engine vibration could result from other types of failure. Active development is in hand, involving the engine and aircraft manufacturers in studies, test bed trials and flight tests of a vibration monitoring and warning system to provide the pilot with visible and audible warning of excessive vibration levels, thus allowing power to be reduced or the engine shut down to prevent serious damage. It is hoped that the system will be cleared for service early in 1985. In addition, the possibility of reducing fuel pipe susceptibility to vibration damage is under examination.
5. Consideration has also been given to the possible implications of the crash for safety procedures at Boscombe Down. It has long been A & AEE practice to avoid deliberate flight over or near the Establishment buildings at Porton Down, except for essential preplanned and notified test sorties. This briefing has now been further strengthened by formal inclusion in the A & AEE Flying Order Book as a means of ensuring its continued observation.
6. The Porton Range Designated Danger Area defines the area in which range activities might conceivably endanger aircraft overflying without clearance. It thus offers a convenient means of controlling military flying and, as a further precaution to avoid any ambiguity, the Area is being extended to cover the buildings at Porton Down as well as the range itself.

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