MINISTRY OF DEFENCE

Military Aircraft Accident Summary

MILITARY AIRCRAFT ACCIDENT SUMMARY

OF RAF BOARD OF INQUIRY

Aircraft:	Nimrod R1 XW666
Date of Accident:	16 May 1995
Place of Accident:	4½ nm NE of RAF Lossiemouth
Casualties:	Three minor injuries

Synopsis

1. On the morning of 16 May 1995, the Nimrod was on a routine post-servicing airtest when a fire broke out adjacent to the No 4 (outer starboard) engine, shortly followed by one in the No 3 engine. The crew carried out the engine fire drills but were unable to extinguish or contain the fire. Following two explosions and with panels coming away from the starboard wing, the captain decided to ditch into the Moray Firth whilst he was still able to control the aircraft. The ditching was successful and all seven crew (the minimum Nimrod crew) escaped without serious injury. The Inquiry concluded that the accident was caused by technical difficulties beginning with an electrical short circuit which triggered a chain of events resulting in a massive fuel leak that ignited in an area inaccessible to the engine extinguisher system.

Background

2. The aircraft was one of three reconnaissance variants and had just undergone a major servicing at the Nimrod Major Servicing Unit (NMSU), RAF Kinloss by RAF maintenance personnel. The aircraft was not carrying any of its specialist role equipment.

Circumstances

3. Weather conditions in the area were excellent and the sea was calm. After approximately 35 minutes of flight, following a test of the aircraft's anti-icing system, the No 4 engine fire warning illuminated. Whilst the crew were carrying out the fire drill, the No 3 engine fire warning also illuminated. A rear crew member confirmed that the aircraft was on fire and advised the captain that panels were falling away from the starboard wing. After two explosions, the captain feared for the structural integrity of the aircraft and decided to ditch before he lost control authority. Without the aid of flaps, which failed to operate because of a fire-associated hydraulic failure, he completed a controlled ditching into the sea.

Rescue/Salvage Operation

4. Both wing dinghies had become detached on or after initial impact, so the crew deployed a dinghy from inside the fuselage, climbed aboard and paddled clear of the aircraft. Two RAF Sea King helicopters quickly arrived on scene, rescued the crew and took them to RAF Lossiemouth. The captain and two others were taken to hospital suffering from minor fractures.

Aircraft Damage

5. The aircraft bounced twice onto the sea before settling. The fuselage broke into two and the aircraft subsequently sank, although a substantial proportion of the wreckage was recovered for investigation.

Investigation

6. With the assistance of the Department of Transport's Air Accident Investigation Branch, the Inquiry established that despite the correct application of maintenance procedures, the DC electrical loom attached to No 4 engine had sustained mechanical damage, although it could not be positively determined how or when. Arcing occurred when the engine anti-icing system was switched on and this led to initiation of the air starter system. With the No 4 engine already running at idle as part of the overall airtest there was no load on the starter turbine, which quickly ran up to high speed. The nut holding the turbine disk in place failed, allowing the disk to move back on its shaft and out of its protective housing. It then struck the engine bypass casing and the No 2 fuel tank, puncturing both. The resultant fuel leak was ignited either by electrical arcing within the faulty DC loom or by the heat of the engine. The fire spread rapidly to the wing area and forward to the engine intake area. The Inquiry concluded that a sequence of technical difficulties led to the uncontained fire. For their handling of this emergency, the captain of the aircraft was awarded the Air Force Cross and one of the crewmen was awarded a Commendation for Bravery in the Air.

Safety Recommendations

7. The Inquiry's main recommendations focused on improving maintenance procedures for the electrical looms, the need to isolate electrical circuits in the vicinity of the engines and replacing the nuts holding the starter turbine in place with ones of higher quality.

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