

No. 12

ALIA (The Royal Jordanian Airlines), Dart Herald, JY-ACQ, accident on Kanisa Mountain, Syrian Arab Republic, on 10 April 1965. Report undated, released by the Directorate of Aviation Safety, Directorate General of Civil Aviation, Ministry of Defence, Syrian Arab Republic

1. - Investigation1.1 History of the flight

The aircraft took off from Beirut International Airport, Lebanon, at 1955 hours GMT on a non-scheduled international flight to Amman, Jordan. The aircraft was cleared to climb to and maintain FL 135 according to the flight plan submitted. At 2014 hours the aircraft reported to Damascus Centre over Dakweh at FL 120 climbing to FL 135 and estimating Damascus beacon at 2019 hours. The aircraft having not reported over that beacon by 2020 hours, the Damascus Centre controller initiated a series of calls which were not answered by the aircraft. At 2035 hours, a telephone call indicated that an aircraft flying west to east was seen on fire and had crashed half-way between the Syrian border and Damascus. It was subsequently found that this was the subject aircraft, and that it had crashed at approximately 2016 hours on a 45° slope of a mountain at a height of 4 200 ft AMSL on a heading of 340° M. The co-ordinates of the accident site were 33°34'32" N, 36°04'42" E.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	4	50	-
Non-fatal	-	-	-
None	-	-	

1.3 Damage to aircraft

The aircraft was destroyed.

1.4 Other damage

None mentioned in the report.

1.5 Crew information

The pilot-in-command held an airline transport pilot's licence with various ratings including one for the Herald. He had passed his last instrument rating check on 9 March 1965 and his last medical examination on 13 March 1965. He had flown a total of 7 453 hours including 1 053 hours on Heralds, of which 102 hours had been flown during the last 90 days.

The co-pilot held a commercial pilot's licence with a rating for the Herald. He had passed his last instrument rating check on 1 December 1964 and his last medical examination on 28 November 1964. He had flown a total of 2 021 hours including 1 161 hours on Heralds, of which 155 hours had been flown during the last 90 days.

1.6 Aircraft information

The aircraft's certificate of airworthiness was valid until 14 December 1965. A certificate of maintenance was issued on 17 March 1965 and was valid for 45 days or 200 hours, whichever was the sooner. Since the certificate of maintenance was issued, 132 hours had been flown. Examination of the aircraft's maintenance records indicated that the aircraft had been properly maintained.

The aircraft's gross weight and centre of gravity were within limits.

The aircraft carried 1 810 kg of fuel at the time of take-off. The type of fuel being carried was not stated in the report.

1.7 Meteorological information

The forecast for the area from 1200 hours on 10 April to 0600 hours on 11 April was:

Ceiling : 5/8 cirrostratus

Visibility: 20 km

Probably after 1200 hours:

Visibility: 15 km with dust

Ceiling : 4/8 altostratus at 12 000 ft and 7/8 cirrostratus at 20 000 ft

At 2000 hours the actual weather was as follows:

Beirut:

Wind : calm

Visibility: 10 km

Clouds : 8/8 Ac As at 10 000 ft, mist

QNH : 1 008.5 mb

QFE : 1 005.2 mb

Damascus:

Wind : calm

Visibility: 20 km

Clouds : 8/8 at 20 000 ft

QNH : 1 014.7 mb

QFE : 929.5 mb

1.8 Aids to navigation

Not pertinent to the accident.

1.9 Communications

They were functioning satisfactorily up until 2014 hours when the aircraft reported its position and flight level.

1.10 Aerodrome and ground facilities

Not pertinent to the accident.

1.11 Flight recorders

Not mentioned in the report.

1.12 Wreckage

Examination of the wreckage site showed that the aircraft had struck the ground in a flat attitude with very little forward speed and was side-slipping to the right on impact.

A number of objects were found along the estimated flight path of the aircraft before the main wreckage. These included a large leather cushion 5 km from the main wreckage, a frame from the forward centre roof lighting panel, a meal tray and two passports 500 m farther. Then between 1.5 km and the main wreckage a wooden glass tray, a cargo lashing ring and various personal effects or objects including a camera. A metal bar box as well as 8 bodies were recovered at 700 to 800 m from the main wreckage and were believed to have been ejected from the aircraft by centrifugal forces when the aircraft probably was in a steep uncontrolled left turn immediately before the crash. None of these items showed any evidence of fire except for some small pieces of wood, pieces of a leather case and of aircraft insulating material which might have been carried there from the main wreckage by convection currents.

1.13 Fire

Although witnesses reported having seen the aircraft on fire in flight, no positive evidence of an in-flight fire could be found.

A severe ground fire which resulted from the disruption of the fuel systems and tanks at impact almost completely destroyed the fuselage and caused considerable damage to both wings.

The aircraft carried two extinguisher bottles - one in each nacelle. The port side bottle was found discharged but as the light alloy operating head was completely melted away in the ground fire, it is not known whether the bottle had been operated. The starboard bottle was not recovered but, as the ground fire had been particularly severe in the area where the bottle was mounted, the bottle is thought to have been consumed by fire. Three CO₂ capsules from the cabin hand extinguishers were recovered and had not been operated.

In spite of the fact that the response of three fire services was forthcoming with the least possible delay, the location of the accident site (at a height of 4 200 ft) and the rough steep approaches to it did not permit the fire vehicles to approach nearer than approximately 1 km. Consequently, only hand fire extinguishers could be brought to the main wreckage area and the size and intensity of the fire was beyond their capacity.

1.14 Survival aspects

No information contained in the report.

1.15 Tests and research

The severely burned out condition of the wreckage made the testing of individual components impossible. The manufacturers of the aircraft, however, propose to undertake a programme of tests and studies on the fuselage structure in order to investigate and rectify any inherent weaknesses.

2. - Analysis and Conclusions

2.1 Analysis

Examination of the propellers and engines showed that both power units had been rotating on impact under low power, the starboard producing rather more than the port.

All control surfaces with their associated tabs and mass balances were present in the main wreckage. All exits, emergency exits and the ditching escape hatch were present in the main wreckage and were in the locked position when the aircraft struck the ground.

A thorough examination of the wreckage did not reveal any evidence of any explosive object or materials having been placed in the aircraft.

The flight deck area had been so severely damaged by fire that, although a considerable number of instruments were identified, no useful information or settings could be obtained from them.

As all doors and emergency exits were found to have been locked when the aircraft struck the ground, a rupture of considerable size must have occurred in the fuselage at least 5 km back along the aircraft's flight path to enable numerous objects to come out of the fuselage. The position of some of them indicated that this rupture was almost certainly at some point between the forward part of the passengers cabin and the flight deck. Destruction of the fuselage by ground fire has prevented the exact position of this rupture from being determined. It is evident, however, that it was sufficiently serious to prevent the aircraft's flying controls from functioning properly and the last stages of the flight could not have been controlled by the crew.

It is probable that at the same time disruption of the electrical circuits caused by the structural failure of the front fuselage had rendered the radio installations inoperative.

The structural failure of the fuselage occurred before any fire broke out. However, it was considered possible that an in-flight fire broke out before the aircraft struck the ground and that any evidence of this fire was subsequently destroyed by the severe ground fire.

2.2 Conclusions

Findings

The crew were properly certificated.

The aircraft had a valid certificate of airworthiness and had been properly maintained and operated in accordance with the relevant requirements.

The structural failure of the fuselage occurred before any fire broke out. Although witnesses stated that they saw the aircraft on fire in the air, no positive evidence of fire in flight could be found in the wreckage. If such evidence did exist, it must have been destroyed by the ground fire.

There was no evidence of any explosive object or materials having been placed in the aircraft.

Cause or Probable cause(s)

The cause of the accident was structural failure of the fuselage in flight.

3. - Recommendations

It was recommended:

- that the manufacturer and the airworthiness authority together undertake urgent consideration of the fuselage structure in order to determine the action necessary to avoid any similar failure;
 - that the manufacturer and the airworthiness authority ensure that such action is carried out;
 - that copies of this accident report be sent to the State of Manufacture and the manufacturer.
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