



LOCKHEED L-1011 A40-TX ACCIDENT
AT KARACHI INTERNATIONAL AIRPORT, KARACHI, PAKISTAN
REPORT REF : DGCA/AWR/290/TX/84
RELEASED BY THE DIRECTORATE GENERAL OF CIVIL AVIATION
SULTANATE OF OMAN

LOCKHEED L-1011 A40-TX ACCIDENT AT KARACHI INTERNATIONAL AIRPORT, KARACHI, PAKISTAN ON 26 APRIL, 1983 - REPORT
REF : DGCA/AWR/290/TX/84, RELEASED BY THE DIRECTORATE GENERAL OF CIVIL AVIATION, SULTANATE OF OMAN.

SYNOPSIS

At approximately 1619 local time, Gulf Air flight 725, a scheduled international passenger service flight from Karachi, Pakistan to Dubai, United Arab Emirates, initiated a takeoff with 127 passengers and 13 crew members aboard. During the takeoff run at approximately 130 knots, two tyres burst. Decision speed was 141 knots.

Gulf Air 725 aborted the takeoff and using the normal and then the alternate braking system as well as reverse thrust from the engines, brought the aircraft to a stop on taxiway Number One, just clear of the runway.

The passengers were disembarked down steps through the number 1 and number 2 right main cabin doors. There were no injuries.

The aircraft sustained substantial damage including the loss of three hydraulic systems. There were additional secondary damage incurred.

The Directorate General of Civil Aviation Accident Investigation Committee determines that the probable cause of the accident was failure of two tyres as a result of their sustaining cuts from a foreign object.

1. FACTUAL INFORMATION

1.1. History of Flight

At 1619 local time in Karachi, on 26 April, 1983, a Lockheed L-1011, A40-TX, operating as Gulf Air flight 725 (GF 725), a scheduled international passenger flight from Karachi, Pakistan to Dubai, United Arab Emirates,

initiated a takeoff from Karachi with 127 passengers and 13 crew members on board.

The departure was completely normal through the push back, starting engines and taxiing phase. The aircraft was cleared to line up and hold Runway 25R.

At 1616 Gulf was cleared for takeoff. At 1617 Gulf Air entered the runway for takeoff. At 1619 Gulf Air 725 initiated the takeoff roll.

The aircraft was operating normally. The engine power application was made and as the aircraft accelerated at a normal rate through 130 knots at a point approximately 3400 ft. from the departure end of the runway, a loud sharp report was heard by the captain and lateral vibration of an unusual magnitude was felt.

The captain who was the non-handling pilot, called for the takeoff to be abandoned. He simultaneously placed the engines into reverse thrust.

Almost simultaneously with the report and vibration, the crew noticed "numerous" segment caution and warning lights illuminated. These included indications for hydraulic systems A, B then C systems. At approximately 75 knots, following a report from the first officer that his full brake application was having no effect, the captain took over control of the aircraft and directed alternate brake system selection. Braking effect was nil.

The aircraft was maneuvered into a gradual turn on the high speed taxiway number 1 and was finally brought to a halt with reverse thrust.

Reverse thrust was maintained for some length of time until the ground crew placed chocks under the wheels to prevent the aircraft from rolling forward on the slight down slope of the taxiway.

The aircraft was finally shut down and the passengers evacuated down steps that were placed by R-1 and R-2 main cabin doors.

At approximately 1700, the left main landing gear strut inner cylinder failed completely immobilizing the aircraft on the taxiway.

1.1.1. Crew Testimony

The captain, first officer and the flight engineer were interviewed concerning the takeoff. They all stated that the aircraft was operating normally including a normal acceleration up to the point where the loud report/vibration was heard and felt.

The first officer stated that he was making the takeoff and everything was normal until the tyre(s) burst. He made an immediate full application of brakes at the captain's command of abandon. The brake application had no effect and he relayed this to the captain.

The captain took over controls at approximately 75 knots, changed to alternate brake systems and he stated that the systems had no effect. He stopped the aircraft using reverse thrust from the engines.

1.2. Injuries to Persons

There were no injuries sustained by any of the passengers or crew members. There were no injuries sustained by other personnel in connection with the abandoned takeoff.

1.3. Damage to aircraft

The aircraft was initially damaged as the number 2 front and rear tyres were cut in a circular pattern some 80 mm in diameter. These cuts were to a point of 80% of

the undertread cords, on both of these tyres. The number one rear tyre also had a cut on the side wall. These two (number 2 front and rear) tyres "exploded" from pressure and rotational velocity. The debris was thrown into the aircraft. The damaged area was primarily the wheel well and area above and aft of the main landing gear.

Damage was sustained by the flaps, spoilers, aileron controls, electrical circuits and hydraulic lines. The integrity of three hydraulic systems was lost, "B" immediately, "A" 4 seconds or less later then "C" some 50 - 55 seconds later. As a result of the failure of the hydraulic systems due to fluid loss, the brakes failed. At a point some 30 - 40 minutes after the aircraft was stopped, the left main landing gear strut inner cylinder failed circumferentially. (See Appendix A).

1.4. Other Damage

None.

1.5. Personnel Information

The flight crew were properly certified and qualified for the flight. (See Appendix B).

1.6. Aircraft Information

The aircraft, a Lockheed L-1011-385-1-15, Serial Number 1133, A40-TX, was certified, equipped and maintained in accordance with the Directorate General of Civil Aviation, Sultanate of Oman, requirements. The aircraft is equipped with three Rolls Royce RB 211-524 engines.

The takeoff gross weight of the aircraft was 167,682 Kgs., well below the maximum of 211,400 Kgs. The balance was computed at a stabiliser trim setting of 4.0. This is well within the limits of 2½ to 5½.

1.7. Meteorological Information

The weather reported at the time was surface wind 230° 15 knots, visibility 7 km with haze altimeter 1004.0 millibars temp. 23°C.

1.8. Aids to Navigation

Not applicable.

1.9. Communications

There were no communications difficulties.

1.10. Aerodrome Information

Karachi International Airport is located at Karachi, Pakistan - N 54.1° E 06709.0°. There were two parallel runways and is surrounded by generally level terrain.

Runway 25 right is 10,500 feet long and 150' wide. There is a 1000 feet stopway at each end of the runway. Elevation is 100 feet.

1.11. Flight Recorders

The aircraft was equipped with a Fairchild A-100 Cockpit Voice Recorder, Serial Number 4486. The recorder was removed from the aircraft undamaged and delivered to National Transportation Safety Board's Audio Laboratory in Washington, D.C., U.S.A. The audio quality of the recorder tape was excellent and the timing of the tape was accurate. A transcription was made of voice communications and related cockpit sounds. (See Appendix C).

The aircraft was also equipped with a Laval 1192-003 Digital Flight Data Recorder, Serial Number 638. This recorder was also delivered to the National Transportation Safety Board in Washington D.C., U.S.A. where a print out of the recorded information was completed. (See Appendix D).

1.12. Debris Information

The debris from the tyres and aircraft parts is included as Appendix E. No attempt was made to identify location of individual items by type. It is worthy of note that the debris pattern as indicated begins at a point approximately 3400 feet from the departure end of the runway and coincides with the "bright spot" on the runway where most of the reverted rubber had been removed in a circular pattern (See photos 1 and 2). This further coincides with the marks made by the two burst tyres. These marks (see photos 3 and 4) start immediately after the "bright spot" and indicate full deflation approximately 20 feet further. These marks continue to the point where the aircraft came to rest (See Appendix E).

1.13. Medical and Pathological Information

Not applicable.

1.14. Fire

Not applicable.

1.15. Survival Aspects

This was a survivable accident.

1.16. Tests and Research

Scrapings were made of the "bright spot" on the runway at the 3400 foot mark. These were forwarded to Rolls Royce Levensden Laboratory for analysis. They reported only iron and zinc were present. Iron and zinc are not consistent with metals used in any known aircraft but are consistent with metals used with some pieces of ground equipment. (See Appendix G).

The left main landing gear strut was forwarded to Lockheed, California, for analysis to determine the cause of fracture. (See Appendix H).

The loss of braking following the loss of hydraulic systems B and C was the subject to study conducted by Lockheed Aircraft Corporation, U.S.A. They conclude that the loss of the three systems could have been prevented if Service Bulletin 093-29-065 had been complied with. (See Appendix I).

1.17. Additional Information

Not applicable.

2. ANALYSIS

The aircraft was properly certificated and had been maintained in accordance with approved procedures. There is no evidence of any prior damage or failure of any of the aircraft systems, or structure. The flight crew was properly certificated and qualified for this flight. They held current medical certificates. The first officer (Co-Pilot) was handling the control at the time of the accident. Weather was not a factor in this accident.

3. CONCLUSION

3.1. Findings

1. The aircraft was properly certificated and had been maintained in accordance with approved procedures.
2. The flight crew were properly certificated and medically qualified for the flight.
3. There is no evidence of pre-accident failure or malfunction of any of the aircraft systems, or structure.
4. Weather was not a factor in this accident.
5. The aircraft was operating normally prior to reaching a point some 3400 feet from the departure end of runway 25R.

6. The number two front and rear tyres burst almost simultaneously.
7. The captain called for an abandoned takeoff.
8. The flight crew responded correctly to the abandoned takeoff checklist.

3.2. Probable Cause

The Directorate General of Civil Aviation Accident Investigation Committee determines that the probable cause of this accident was failure of two tyres as a result of cuts sustained from a foreign object.
