

ORIGINAL



No.HQCAA/1901/172/SIB

AIRCRAFT ACCIDENT INVESTIGATION

REPORT

M/S. PAKISTAN AVIATOR & AVIATION (PVT) LTD.

ISLANDER BN 2A-26 AP-BEM

NEAR LAHORE

ON

7TH JUNE, 1994.

HQ. CIVIL AVIATION AUTHORITY
KARACHI - PAKISTAN

AIRCRAFT ACCIDENT INVESTIGATION REPORT

FORCE LANDING ACCIDENT TO PAKISTAN
AVIATORS AND AVIATION (PVT) LTD ISLANDER
BN-2A-26 AIRCRAFT AP-BEM ON 7TH JUNE, 1994
AT VILLAGE BHAJIAN ON RAIWIND ROAD WHILE ON
CHARTER FLIGHT ON MULTAN-LAHORE SECTOR

Authority:- Director General Civil Aviation Authority Memorandum No. HQCAA/1901/172/SIB dated 8th June, 1994 (Appendix "A").

COMPOSITION OF INVESTIGATION TEAM

- | | | |
|----|--|------------------------|
| 1. | Air Cdre (Retd) Rashid A. Bhatti.
Actg. Chief Inspector and
President SIB, HQCAA | Investigator-in-Charge |
| 2. | Engr. Afzaal Imad-uddin,
SAS, CAA Lahore Airport
Lahore. | Investigator |

1. AIRCRAFT INFORMATION

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|------|--|--|
| 1.1. | Registration Marking | AP-BEM |
| 1.2. | Aircraft type and Maker's Serial No. | BN-2A-26 (915) |
| 1.3. | Engine Type, airframe position
and Maker's SR No. | Lycoming 0-540E4C5
attached to each wing. |
| 1.4. | Certificate of Registration No. and validity | No.639 valid till further
order |
| 1.5. | Certificate of Airworthiness No.
and date of Expiry. | No.592 valid till 10.4.95 |
| 1.6. | Date of Construction of Airframe | 1983 |
| 1.7. | Name and Address of owner | Pakistan Aviators and
Aviation (Pvt) Ltd. |
| 1.8. | Gross Weight Maximum Permitted by C of A
for this flight. | 6200 Lbs |
| 1.9. | Loading, Centre of gravity limits in C of A | Within limits |
| 1.10 | Airframe History | |

1.10.1	Flying time Since Manufacture	4356:25 Hrs
1.10.2	Flying time Since Last Overhaul	17:25 Hrs
1.10.3	Flying time Since Last periodic I. Inspection	06.25 Hrs
1.11.	Engine History	
1.11.1.	Flying time Since Installation	PORT 3859:45 Hrs STBD 3994:05 Hrs
1.11.2.	Flying time Since Last Overhaul	394:05 Hrs
1.11.3.	Flying time Since periodic check	06:25 Hrs
1.11.4.	Defect discovered during investigation	Nil

2. CREW INFORMATION

2.1.	Pilot-in-Command	
2.1.1.	Name	Capt.Azhar Ayub
2.1.2.	Position in Cockpit	Left hand seat
2.1.3.	Date of Birth	29.01.66
2.1.4.	Type of License & No.	CPL 1630
2.1.5.	Medical date & status	07.2.94 Fit
2.1.6.	Rating	
	2.1.6.1. Type(s) held	Cessna 152, 172, F 2A-26
	2.1.6.2. Type Current	All
	2.1.6.3. Flight Instructor rating	K.152,172
	2.1.6.4. Check rating	N/A
2.1.7.	Flying Experience	
	2.1.7.1. Grant Total	1370 Hrs
	2.1.7.2. Total in Command	1200 Hrs
	2.1.7.3. Total in Command on 22 Hrs Type accident occurred	
	2.1.7.4. Where trained	Rawalpindi Flying Club
	2.1.7.5. Date of Joining the Organization	August,1993

3. HISTORY OF ACCIDENT

- 3.1. Islander BN-2A-26 aircraft Nationality and Registration Marks AP-BI belonging to Pakistan Aviators and Aviation (Pvt) Ltd was on a charter flight

booked by Mian Shahbaz Sharif, Captain Azhar Ayub Awan serving Charter Pilot with Pakistan Aviators was detailed to operate a Charter Flight as pilot-in-Command from Lahore to Walton to Bahawalpur to Multan return to Lahore.

3.2. The aircraft took off from Lahore Airport at 1600 hrs on 6th June, 1994 to position the aircraft at Walton for Charter Flight to Bahawalpur. After leaving the passengers at Bahawalpur the aircraft took off for Multan. Passengers left at Bahawalpur were required to board the aircraft at Multan as no night facilities were available at Bahawalpur.

3.3. The aircraft took off from Multan at about 2358 hrs on 6th June, 1994 with passengers on board. The ETA for Lahore was 0132 hrs on 7th June, 1994. The Endurance of 0345 hrs was given on Multan - Lahore Sector. When the aircraft was 22 NM from Lahore at an altitude of 4000 feet the pilot experienced vibrations in the left engine and soon after it failed. Within a few minutes the right engine also failed. The pilot had no option but to make a forced landing at night. The aircraft made a safe forced landing at 0130 hrs in a field at 15 miles from Lahore near village Bhajian on Raiwind Road on a heading of 040°. All 8 souls on board the aircraft were safe and aircraft sustained repairable damage.

4. INJURY TO PERSON (S)

4.1. None

5. DAMAGE TO AIRCRAFT

5.1. See Appendix "B" and "C", to "C" 12

6. OTHER DAMAGE

6.1. Nil

7. METEOROLOGICAL CONDITION

7.1. The weather was fair. The weather was not a factor in this accident (Appendix "D")

8. NAVIGATION & LANDING AIDS

8.1. All radio - navigation aids were serviceable at the time of the accident.

8.2. Radio Navigation aids were not factor in this accident.

9. COMMUNICATION

- 9.1. Radio Communication between the aircraft and ATC were normal. aircraft was all the time in contact with Lahore Radar Approach Controller. At such time, the Captain of aircraft announced that he is going to make a forced landing while descending through 3000 feet height (See the transcript of TIR extract at Appendix "E" and Radar Video Replay at Appendix "F").

10. AERODROME AND GROUND FACILITIES

- 10.1. Lahore International Airport elevation is 711 feet AMSL. The runway direction is 36/18. ILS is available on runway 36R. Radio NAV.AIDS include VOR and NDB. All radio and Navigation Aids facilities were serviceable and available.

11. FLIGHT RECORDER/C.V.R

- 11.1. Not provided in this type of aircraft.

12. WRECKAGE AND IMPACT INFORMATION

- 12.1. See wreckage Diagram at Appendix "G".

13. FIRE

- 13.1. No fire occurred during or after the accident.

14. SURVIVAL ASPECTS

- 14.1. It was a survivable accident.
- 14.2. All the passengers (7) and the Captain of aircraft evacuated the aircraft without any injury.

15. TEST AND RESEARCH

- 15.1. Nil

16. INVESTIGATION

- 16.1. On 7th June, 1994 at about 0130 hrs PST Pakistan Aviators and Aviation (Pvt) Ltd aircraft Islander BN-2A-26 AP-BEM operating as Charter Flight from Multan to Lahore International Airport made a forced Landing at night in fields at 15 miles from Lahore on heading of 040° near village Bhajian Raiwind Road. All 8 souls on board the aircraft were safe and aircraft sustained repairable damage.

- 16.2. Investigators were immediately appointed as per Appendix "A". Investigator-in-Charge arrived at Lahore from Karachi at 0900 hrs PST on June, 1994. Mr. Afzaal Imad-uddin, Senior Airworthiness Surveyor who appointed as a technical member and investigator was present at Lal airport at the time of Accident. The Investigator team proceeded to the scene of accident and commenced with the investigation. From the initial survey of the scene of accident, the statement of the pilot and the witnesses, and examination of the aircraft fuel tanks which were found empty, it became apparent that the aircraft experienced double engine failure during flight to fuel starvation.
- 16.3. The Investigation team looked into the possible causes of fuel starvation to engines. The Islander BN-2A-26 aircraft has usable fuel capacity of 130 U.S. gallons in two wing tanks (65.00 U.S. gallons each tank). There are fuel gauges in the cockpit i.e. one for each tank. The aircraft uplifted 115 Liters (85 U.S. gallon) of fuel from shell Pakistan before departure from Lahore Airport. Before start up for the mission the pilot checked the gauges which showed full indication. Therefore, it is apparent that aircraft was serviced upto its total fuel capacity.
- 16.4. At the scene of accident all the fuel lines and their connections were physically checked for any rupture or loose fittings which may have caused heavy fuel leakage. All fuel pipes and various connections were found in good order. Therefore, the possibility of fuel leak as a cause of fuel exhaustion was ruled out.
- 16.5. The reliability of fuel gauges indication system was also checked and found to be quite accurate.
- 16.6. MISSION PLANNING
- 16.6.1. The pilot had planned Charter Flight from Lahore to Walton Bahawalpur to Multan and back to Lahore on the basis of 6 hours total endurance of Islander BN-2A-26 aircraft without consulting relevant performance charts for the calculation of fuel requirements particularly when the surface temperatures were between 40°C to 45°C at different points of departures.
- 16.6.2. Captain Azhar Ayub had ferried this aircraft from U.S.A. to Karachi with ferry tanks. During these ferry missions, on the average the observed fuel consumption per hour was about 22 gallons. W

this figure in mind Captain Ayub always thought that the endurance of Islander aircraft, with its fuel capacity of 130.00 U.S. gallon about 6.00 hours.

- 16.6.3. The calculated flight time for the Charter Mission was 4 hours and Min. Since Captain Ayub had always thought that the endurance of this aircraft was about 6 hours therefore, he could undertake the mission without any refuelling requirement. As such no refuelling was planned for this chartered flight. According to the statement of the pilot the fuel remaining at Multan was about 60 to 65 U.S. gallons therefore, he thought that he will be able to reach Lahore safely within about 1 hr and 30 minutes of calculated flight time. The aircraft however, had double engine failure 15 NM short of Lahore. This came as a surprise to Captain Ayub and he mentioned in his statement that it is still not understood as the aircraft had flown 04.10 minutes against total endurance of 6.00 hrs.

16.7. TOTAL ENDURANCE CALCULATIONS

- 16.7.1. Total usable fuel capacity of Islander BN-2A-26 aircraft is 130 U.S. gallons. The flight plan involved 4 take offs i.e. from Lahore, Waltham, Bahawalpur and Multan and climb to 1500 ft, 8500 ft, 6500 ft and 9000 ft respectively from each place of departure. As per performance chart placed at Appendix "H" the total time taken during all climbs with temperatures ISA+25°C would be approximately 44 minutes and fuel consumed would be 32.00 U.S. gallons. The fuel used during ground running at 4 different places would be approximately 10 gallons.

- 16.7.2. The fuel available for economic cruise is $(130 - 42) = 88$ gallons. Therefore total time for cruise @ 25.0 GPH is 3 hours and 30 minutes. The total endurance available is = cruise time + time taken during climbs i.e. $3:30 + 00:44 = 4$ hours and 14 minutes. (See Appendix "I")

17. DISCUSSION OF EVIDENCE

- 17.1. Captain Azhar Ayub had planned the Charter Flight mission on the basis of 6 hours of total endurance of Islander aircraft. This figure of 6 hours was based on average fuel consumption of 22 GPH during several ferry missions flown with ferry tanks for about 10 hours of endurance. It was not realized that the average fuel consumption

observed during ferry mission was totally under different mission profile which involved only one take off and one climb to cruise altitude under different temperature environments.

- 17.2. The Charter Flight plan involved 4 take offs and off course 4 climb to different altitudes when surface temperatures were approximately 40 to 45°C at different places. Captain Azhar had only calculated the total flight time to 4 destinations which was 4 hours and 10 minutes only. For the calculation of total fuel requirement for the mission, Captain Azhar apparently did not consult the relevant performance charts for Islander aircraft. Had he calculated the fuel requirement for the planned Charter Flight as per the mission profile he would have realized that the total usable fuel capacity of 130.00 US. Gallons for Islander aircraft was not sufficient for the mission. This charter Flight certainly required a refuelling at either Bahawalpur or Multan in order to reach Lahore with minimum fuel reserve of 45 minutes as per standard operating procedures. Since no refuelling was carried out, therefore, both the engines of aircraft failed where they should have failed as per fuel requirement calculations.

18. WITNESSES

- 18.1. The statement of following witnesses is attached to this report.

- 18.1.1. Captain Azhar Ayub Awan (Appendix "J")
- 18.1.2. Wg. Cdr (Retd) Anthony Choudhry (Appendix "K")
- 18.1.3. Maj. (Retd) Shaukat Parekh (Appendix "L")
- 18.1.4. Initial Occurrence Report (Appendix "M")
- 18.1.5. Rashid M. Hussain ATCO (Appendix "N")
- 18.1.6. Athar Shams ATCO, Lahore Airport (Appendix "O")

19. FINDINGS

- 19.1. The aircraft certificate of Registration, Certificate of Airworthiness and Charter/Aerial work Licence were valid.
- 19.2. The pilot had valid Licence and was rated for the type of aircraft.

- 19.3. The Charter Flight from Lahore to Walton to Bahawalpur to Multan and back to Lahore was authorized by Chief Pilot Pakistan Aviators (Pvt) Ltd.
- 19.4. Captain Azhar pilot-in-Command planned the mission on the basis of 6 hours of total endurance of Islander aircraft.
- 19.5. The 6 hours endurance was based on average fuel consumption of 22 C observed during several ferry missions of about 10 hours of endurance flight with ferry tanks from U.S.A. to Karachi.
- 19.6. The total flight time calculated for the Charter mission was 4 hours and 10 min.
- 19.7. The Captain did not study the relevant performance charts for the calculation of fuel requirements as per mission profile.
- 19.8. The fuel requirement for the planned mission was calculated with the help of relevant performance charts. It was discovered that aircraft had total of 4 hours and 14 minutes of flight time available for the type of mission profile flown when the surface temperatures were approximately 40°C to 42°C at different points of departures.
- 19.9. This chartered mission required a refuelling at Multan in order to reach Lahore with minimum fuel reserve of 45 minutes as per S.O.P.
- 19.10. Since no refuelling was carried out therefore, both the engines failed at about 4 hours and 10 minutes of total flight time.
- 19.11. Pilot made a forced landing at night at about 0130 hours near village Bhajri on Raiwind Road 15 NM from Lahore.
- 19.11. All 8 persons on board were safe and aircraft sustained repairable damage.

20. CAUSE

- 20.1. The cause of the accident was that pilot did not plan the charter flight with the help of relevant performance charts as per the mission profile, and the amount of fuel required was not calculated properly.
- 20.2. Both the Engines failed after 4:10 hours of flight time due to fuel starvation as no refuelling was carried out due to poor mission planning.

21. RECOMMENDATIONS

- 21.1. It is recommended that Captain Azhar Ayub Awan CPL No.1630 be suspended for a period of 6 months from the date of accident for violation of rule 155 (2) and rule 273(1) (d) of Civil Aviation Rules 1978.
- 21.2. Before his licence is revalidated he must prepare at least 4 flight plans with different mission profile involving landing at 4 different places by using Islander aircraft performance charts for various temperature conditions. These flight plans will be submitted to President SIB.
- 21.3. It should be emphasized to all General Aviation Pilots that all Navigation flights must be planned thoroughly with the help of relevant aircraft performance charts.
- 21.4. To effectively supervise the flying activities of General Aviation Companies in the North and South, the existing establishment of 2 GMGAs, in the Inspectorate Division, presently lying vacant must be utilized by Inducting suitable GD(P) officers from the PAF.

APP."C₁"



AIRCRAFT TOUCH DOWN POINT AND FINAL STOP POSITION

APP."C₂"



PATH MADE BY A/C AFTER TOUCH DOWN

APP. "C"₃



FRONT VIEW OF AIRCRAFT

APP. "C"₄



TRACK MADE BY LANDING GEAR



LEFT HORIZONTAL STABILIZER DAMAGED



LEFT HORIZONTAL STABILIZER AND FLEVATOR DAMAGED

APP. "C" 7



LEFT WING TIP DAMAGED (SIDE VIEW)

APP. "C" 8



LEFT WING TIP DAMAGED (FRONT VIEW)

APP. "C" 9



LEFT UNDER CARIAGE BROKE FROM ITS MOUNTING BASE

APP. "C" 10



LEFT UNDER CARIAGE

APP. "C"₁₁



RIGHT UNDER CARIAGE BROKE FROM ITS MOUNTING BASE

APP. "C"₁₂



BOTH FUEL QUANTITY INDICATOR READING ZERO