

ORIGINAL

NO.HQCAA/1901/227/SIB



CIVIL AVIATION AUTHORITY

INVESTIGATION IN RESPECT OF AIR ROUTE

VIOLATION MADE BY M/S FIAC

BOEING - 747 REG.NO.AP-BAK

WHILE OPERATING PK-787/080398

DUBAI - LONDON SECTOR

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KARACHI, PAKISTAN

INVESTIGATION IN RESPECT OF AIR ROUTE VIOLATION
MADE BY M/S PLAC B-747 REG NO. AP-BAK WHILE
OPERATING PK-787/080398 DUBAI-LONDON SECTOR.

Authority:- Director General Civil Aviation Authority
Memorandum No. HQ CAA/1901/227/SIB dated
25th March, 1998 (Appendix 'A')

Composition Of Investigation Team

(a) Air Commodore(Retd) Investigator Incharge
Jamal Hussain
President SIB CAA

1. AIRCRAFT INFORMATION

- 1.1. Aircraft type : Boeing-747-200BC (MSN-21825)
- 1.2. Reg. NO. : AP-BAK
- 1.3. Engine types, airframe : CF6-50E2 : NO.1- 455-954
positions & S.Nos. NO.2-517-517 NO.3- 455-967
NO.4- 528-190.
- 1.4. Certificate of Registration : (534 Rev-I) Date 18-12-1984
- 1.5. Certificate of : S/No.487 / Valid till 29-07-1998
Airworthiness No. & date : CAA-462(Rev-I)
of expiry, and flight
manual No.
- 1.6. Date of construction of : 1979
airframe.
- 1.7. Name address of Owner. : P.I.A.C. Karachi Airport.

- 1.8 Airframe history. (Give : (TSN 58151-44) CHECK-D
flying times since C/OUT on 04-09-1995.
manufacture, last TSN- 52258 Hrs.
overhaul and last periodic
check.
- 1.9 Engine history. (Give : No.1. 455-954 No.2 .517-517
flying time since No.3. 455-967 No.4. 528-190
manufacture, last TSN: 43964-09, 37896-14,
overhaul and last periodic 35368-29, 27471-37.
check. List also essential
modifications completed).
- 1.10 Gross Weights. Maximum : 362873 KGs.
permitted by C of A.

2. CREW INFORMATION

Pilot-in-Command

2.1

- 2.1.1. Name : Arif Hayat
- 2.1.2. Position in the Cockpit : CAPTAIN
- 2.1.3. Date of Birth : 30.03.1939
- 2.1.4. Type of Lic and No : ATPL NO.251/2
- 2.1.5. Medical date with : 14.03.1998/I
status
- 2.1.6. **Rating**
- 2.1.6.1. Type(s) held : B-747, DC-10, B-707-720-DC-3, F-
27, LY-049 and S/E-Piston
- 2.1.6.2. Type current : B-747
- 2.1.6.3. Flt. Instructor : Nil
- Rating.

2.1.7. Flying Experience

- 2.1.7.1. Grand total : 15016.00
- 2.1.7.2. Total -in - : 10343.00
Command

2.1.7.3. Total -in - : 10343.00 (P1)
 Command : 467200 (P2)
 on the type
 accident/
 incident
 occurred

2.1.8. Where trained : Pakistan

2.1.9. Date of Joining the Org. : 18th June, 1964

2.2 **Co-Pilot**

2.2.1. Name : Usman Akber

2.2.2. Position in the Cockpit : Co-Pilot

2.2.3. Date of Birth : 24.04.1954

2.2.4. Type of Lic and No : ATPL NO. 851

2.2.5. Medical date with : 14.11.1997/I Fit for Renewal of
 status ATPL.

2.2.6. **Rating**

2.2.6.1. Type(s) held : A-300, B-747, B-707, B-720, F-27
 ZE-Jet, S-E-Pist and Four Eng-Pist.

2.2.6.2. Type current : B-747

2.2.6.3. Flt. Instructor : Nil
 Rating.

2.2.7. **Flying Experience**

2.2.7.1. Grand total : 6826.00 Hours

2.2.7.2. Total -in - : -
 Command

2.2.7.3. Total -in - : 1743.00 (P1)
 Command : 5083.00 (P2)
 on the type
 accident/
 incident
 occurred

2.2.8. Where trained. : Pakistan

2.2.9. Date of Joining the Org. : 2nd February, 1986

2.3 Flight Engineer

2.3.1. Name : Habib
2.3.2. Position in the Cockpit : Flight Engineer
2.3.3. Date of Birth : 10.04.1950
2.3.4. Type of Lic and No : F/E Lic. No.125
2.3.5. Medical date with status : 11-11-1997/1 (F/E)

2.3.6. Rating

2.3.6.1. Type(s) held : B-747, A-300, DC-10, B-707-720
2.3.6.2. Type current : B-747

2.3.7. Flying Experience

2.3.7.1. Grand total : 12274.00
2.3.8. Where trained. : Pakistan
2.3.9. Date of Joining the Org. : 29th April, 1968

3. SUMMARY OF INCIDENT

- 3.1 PIA flight Pk-787 was authorized to fly Dubai-London sector with Captain Arif, Co-pilot Usman and Flight Engineer Habib as Cockpit crew.
- 3.2 Push back, start up, taxi, take off, departure and climb to cruise altitude was uneventful. Take off was executed by the Co-pilot who was asked by the Captain to fly the sector.
- 3.3. Enroute navigation was proceeding as per plan. Aircraft Nav System was on INS mode. Esfahan and SV check points were reached and reported. Between SV and Zanzan, the next reporting point, the Co-pilot, after informing the Captain, left his seat for about 15-20 minutes as per his statement to go to the toilet. When the Co-pilot returned to his seat, the aircraft was supposed to have crossed Zanzan and was to proceed towards the next reporting point, DASIS, which is also the FIR boundary between Tehran and Ankara. Five minutes after he had resumed his position the Co-pilot noticed that the aircraft was heading away from DASIS and he also saw the Nav Mode Selector Switch was lying on 'Heading Mode' instead of INS mode. He informed the Captain of this discrepancy. The Captain realized that the aircraft had drifted off track and together with the Co-pilot and the help of VORs they established their position about 130 miles North of track. (See appendix-B). A correction was applied immediately and Ankara was contacted which confirmed their position and cleared them direct to Erzurum, the reporting point after DASIS. Nav Mode Selector switch was reselected to INS and the aircraft was brought back on track and Erzurum was reached 3 minutes behind the scheduled time. The remainder of the flight was uneventful.

3.4 During the period the aircraft had strayed off course, no warning from the ground was received. After landing at Heathrow, the Captain informed Director Flight Operation PIA in writing about the incident. Four days later, a telex was received by CAA Pakistan from Azerbaijan CAA where the violation of Azerbaijan airspace by PIA PK-787 was reported. (Appendix-C) Pk-787 had violated Azerbaijan airspace and had flown over the restricted airspace Ngorno Karabakh region before returning to its approved route.

4. INJURY TO PERSONS

4.1 There was no injury to any passenger or the crew members.

5. DAMAGE TO AIRCRAFT

5.1 None

6. OTHER DAMAGES

6.1 None

7. METEOROLOGICAL CONDITION

7.1 V.F.R.

8. FLIGHT RECORDER

- 8.1 Reading from flight data recorder and Cockpit Voice recorder were not available as the incident was reported four days later.

9. Analysis.

- 9.1 From the statements of the Captain, Co-pilot and Flight Engineer (Appendices D,E and F), it is evident that the aircraft navigation system was fully serviceable. The Co-pilot had fed in the enroute data into the Navigation Computer and after reaching cruise altitude, the mode selector switch was on INS and the aircraft was automatically flying the planned route upto Zanzan. The Co-pilot, as is given in 747 SOPs was monitoring the flight and cross checking with other Nav aids to ensure the aircraft was maintaining the desired course.
- 9.2 After crossing point SV, the Co-pilot (as per his statement and further corroboration of the flight engineer (Appendices E and F) left his seat to go to the toilet for about 15-20 minutes. In his absence, the duty of monitoring the aircraft flight became the sole responsibility of the Captain. It appears that between SV and Zanzan, the Captain might have selected Mode Selector Switch to Heading Mode possibly to correct any errors in the INS track with the aid of VOR track, a procedure, permitted in the SOPs. However, after correcting for the INS error, the heading selector mode is supposed to be returned to INS mode. The Captain apparently forgot to change the switch back from Heading Mode to INS.

- 9.3 When the aircraft reached Zanjan, it did not automatically alter course for DASIS, the next check point but it continued on the earlier track of 315 degrees, because the Nav System was on Heading Mode. The Captain assumed that the aircraft had made the necessary course alteration and did not carry out the required cross check with VORs and other Nav aids as is required by SOP (Appendix-G). The aircraft continued on heading 315 degrees instead of tracking 294 degrees for DASIS for about 30-35 minutes without the Captain realising the error. In the process the aircraft had deviated from its approved flight plan and had violated Azerbaijan airspace.
- 9.4 When the Co-pilot resumed his seat he started the flight path monitoring and realized within five minutes that the aircraft was not on track and he also noticed the Mode Selector Switch was on 'Heading Mode'. He informed the Captain of the error and the Captain immediately started the corrective action and eventually brought the aircraft back on course but by then Azerbaijan airspace had been violated.
- 9.5 Since the aircraft was on track for as long the Co-pilot was monitoring the flight and the navigation error came in only when he had left the seat transferring the responsibility of monitoring the course on the Captain, it is fairly evident that the incident took place because the Captain failed to monitor the flight as per the given 747 SOPs. The Captain alone was responsible for the incident.
- 9.6 The aircraft had flown on 315 degrees instead of 294 degrees for about 30-35 minutes before the error was discovered. It is therefore established that the Co-pilot was away from his seat for approximately 30 minutes instead of 15-20 minutes as per his statement. This time interval is longer than what it should usually take for a trip to the toilet.

10. Findings.

- 10.1 The aircraft and the crew were authorized for the flight Dubai-London.
- 10.2 The aircraft Navigation System was fully serviceable and the Co-pilot had filled in the correct data into the Nav Computer.
- 10.3 Take off, climb, departure upto cruise altitude was flown without any incident.
- 10.4 During cruise, the Co-pilot was monitoring the flight as given in the SOP upto point SV.
- 10.5 After point SV the Co-pilot left his seat with the Captain's permission to go to the toilet.
- 10.6 The Captain was supposed to monitor the flight himself till the return of the Co-pilot.
- 10.7 Most probably the Captain selected Nav system to Heading Mode close to Zanzan to correct for any INS error but forgot to bring it back to INS mode on reaching Zanzan.
- 10.8 From Zanzan the aircraft continued on last heading selection for about thirty^{MINUTES} whereas the track for next point DASIS was 294 degrees.
- 10.9 The Captain did not follow the 747 SOP where cross check with other Nav Aids and flight plan must be carried out at each check point to ensure the aircraft is flying within the approved route.

- 10.10 The Captain failed to realise that the aircraft was heading away from the approved route.
- 10.11 On his return after about 30 minutes the Co-pilot spotted the error and informed the Captain who took necessary corrective measures to get back on the approved route.
- 10.12 The aircraft had violated Azerbaijan airspace and had flown over the restricted airspace of Ngorno Karabakh.
- 10.13 No ground control/radar had cautioned flight 787 when it had drifted off course and trespassed into Azerbaijan airspace.
- 10.14 The rest of the flight was uneventful.
- 10.15 The Captain informed the Director Flight Operations in writing about the incident after landing.
- 10.16 Azerbaijan informed CAA of Pakistan about the violation vide their telex given at Appendix-C.
- 10.17 PIAC has taken corrective action against the erring crew as per details given at Appendix-H).

11. Cause.

- 11.1 The incident was caused because Captain Arif Hayat failed to monitor the aircraft flight path as per 747 SOP and allowed it to fly on a wrong heading for over 30 minutes.

12. **Recommendations**

12.1 Director Flight Operations PIAC to re-emphasize:

(a) Maintenance of proper Cockpit discipline where all SOPs regarding flight operations are strictly followed.

(b) Avoidance of lengthy absence from the seat by any of the Cockpit crew. Once the flight operations commence the cockpit crew should not leave their assigned seats except to meet urgent physiological needs.

12.2. Director Flight Operations PIAC to conduct necessary refresher training specially on navigation monitoring SOPs to Captain Arif Hayat before clearing Captain Arif for independent operations again.