

INVESTIGATION REPORT INTO THE INCIDENT
TO M/s. P.I.A.C. B-747 AP-AYW WHILE
OPERATING PK-732 ON 7TH MARCH, 1984

1: Aircraft Information:

- 1.1. Aircraft type & Manufacturer's S.No: B-747-282E
Con.21035
- 1.2. Registration Marking: AP-AYW
- 1.3. Engine Installation and type: 4-JT9D-7A, wing installed.
Manufacturer S.Nos:
1: 695734
2: 685744
3: 685963
4: 685690
- 1.4. Certificate of Registration: 495 (valid).
- 1.5. Certificate of Airworthiness: 448 (valid).
- 1.6. Certificate of Maintenance: 5.4.1983 (FA)12th.
- 1.7. Date of construction Airframe: 28.4.1976.
- 1.8. Owner: M/s. P.I.A.C.
- 1.9. Maximum gross weight permitted: 351534 KGS.
- 1.10. Airframe History:
- 1.10.1. Hours since new: 25,025 hours upto 7.3.1984.
- 1.10.2. total landings: 7,925
- 1.10.3. Hours since check: 47-36 hours
V/VI
- 1.10.3. Modification state: upto date.
- 1.11. History of Engines:
- 1.11.1. Time since new:
- | | <u>Sr.NO:</u> | <u>Hours</u> | <u>Cycle</u> |
|------|---------------|--------------|--------------|
| i) | 695734 | 14397.45 | 4678 |
| ii) | 685744 | 19485.10 | 5421 |
| iii) | 685963 | 16885.44 | 4774 |
| iv) | 685690 | 19900.19 | 6251 |

2: CREW INFORMATION:

2.1. Pilot in-Command:

- 2.1.1. Name: Captain M. Ahmed.
- 2.1.2. Date of Birth: 12th June, 1932.

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- 2.1.3. Type of licence & No: A.L.T.P. No:137.
- 2.1.4. Medical date with status: Valid carried out on 13th February, 1984.
(declared fit subject to use of corrective glasses)
- 2.1.5. Aircraft Ratings:
- 2.1.5.1. Type(s) held DC-3,F-27,Trident 1E B-707-720-B,DC-10 and Boeing-747.
- 2.1.5.2. Type current: Boeing-747.
- 2.1.5.3. Flying Experience:
- 2.1.5.3.1. Grand total: 14,800.40
- 2.1.5.3.2. Total in Command: 10,411.50
- 2.1.5.3.3. Total in Command on the type: 1,705.08.
- 2.1.6. Where trained: United Airline of U.S.A/P.I.A.C.

2.2. Co-Pilot:

- 2.2.1. Name: Captain A.Rashid.
- 2.2.2. Position: Co-Pilot.
- 2.2.3. Date of Birth: 24.5.1936.
- 2.2.4. Type of Licence & No: A.L.T.P. No:364.
- 2.2.5. Medical date with status: Valid. Carried out on 30.1.84.(declared fit subject to use of corrective glasses).
- 2.2.6. Aircraft Ratings:
- 2.2.6.1. Type(s) held:
- 2.2.6.1.1: P-1 F-27
- 2.2.6.1.2: P-2 B-747,B-707/720-B.
- 2.2.6.2. Type current: B-747 (P-2).
- 2.2.6.3. Flying Experience:
- 2.2.6.3.1. Grand Total: 7,339.00 Hrs.
- 2.2.6.3.2. Total in Command: 1,773.09 Hrs.
- 2.2.6.3.3. Total as Co-Pilot on the type: 2,047.45 Hrs.
- 2.2.7. Where trained: United Airline of U.S.A/P.I.A.C.

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2.3. Flight Engineer:

- 2.3.1. Name: Mr. Roy Patel.
- 2.3.2. Position: Flight Engineer.
- 2.3.3. Date of Birth: 6th July, 1936.
- 2.3.4. Type of Licence and No: Flight Engineer Licence No:32.
- 2.3.5. Medical date with status: Valid. Carried out on 5.3.84 (declared fit subject to use of corrective glasses).
- 2.3.6. Aircraft Ratings:
- 2.3.6.1. Type(s) Constellation 1049, B-707/ held: 720-B, DC-10-30, B-747.
- 2.3.6.2. Type B-747.
current:
- 2.3.6.3. Flying Experience:
- 2.3.6.3.1. Grand Total: 15,471.37
- 2.3.6.3.2. Total as
Flight Engineer 2500 Hrs.
on the type: Approx.
- 2.3.7. Where trained: United Airline of
U.S.A/P.I.A.C.

3: History of Flight:

Boeing-747 Reg. Mk: AP-AYW, operated schedule passenger flight No: PK-732 from Jeddah to Karachi on 7th March, 1984. Flight was uneventful from Jeddah till it made an approach on runway 25R at Karachi Airport. Visibility was stated to be 6 K.M. at 0305 PST. However at 0339 when the aircraft descended to the "Decision Height", the visibility had deteriorated. The crew were unable to see the runway. The Pilot in-Command therefore decided to divert to his flight planned alternate airfield, which was Islamabad.

After executing one over-shoot and completing one holding, the aircraft started climbing to 5,000 feet till 25 miles out and there after to FL-290 heading towards Nawabshah enroute to his alternate airfield. However when aircraft had covered 160 N.M. the Pilot in-Command intimated that he would divert to Nawabshah because he did not have enough fuel to reach Islamabad. The aircraft landed

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safely at Nawabshah at 0459 PST. After refuelling at Nawabshah, the aircraft returned to Karachi. Passengers could not disembark at Nawabshah for want of passenger steps. They therefore remained on board the aircraft during the transit period.

4: Injury to persons:

Nil.

5: Damage:

No damage to the aircraft.

6: Other damage:

During its operation at Nawabshah Airport, runway surface and runway lighting system sustained damage. Cost of repairs is being assessed by the ADA.

7: Meteorological condition:

7.1. At 0305 when the weather was passed to the aircraft the visibility was stated to be 6 K.M. (Appendix A-1). After the aircraft made an instrument approach on runway 25R, the crew were unable to see the runway. The aircraft therefore executed an overshoot. After the aircraft executed the overshoot, information with regard to low visibility was passed to the Pilot. (Vis 1 K.M.) (Appendix A-5).

7.2. Correct weather report was not supplied to the aircraft as the Met staff provided only estimated weather (Appendix-C). The observers did not record actual observation on the airside of the building on the plea that the door providing access to the airside was locked by the A.S.F. This was done under orders of the Secretary General Defence. (Appendix-B1).

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- 7.3. Copies of weather report supplied to the ATC are placed at Appendix C-1, C-2 & C-3.

8. Radio Aids to Navigation:

8.1. The aids were operating normally. The aircraft used the instrument landing system during its instrument approach to land at Karachi Airport. The system was operating normally.

8.2. Radio aids to navigation were not a factor in this incident.

9. Communications:

9.1. The aircraft was in contact with the Control Tower.

9.2. Radio communication was not a factor in this incident.

10: Aerodrome & Ground Facilities:

10.1 Nawabshah Airport has runway 20/02. This runway is 9,000 feet long and 150 feet wide. It is equipped with runway lighting system. There is a VOR at the airport. There is no parking space for large aeroplanes. There is no radio landing aid to provide assistance during approach and landing phase.

10.2 Fire fighting facilities exist at this airport which are adequate for operation of small air-carrier aeroplanes like F-27 etc.

11: Flight Recorders:

The Boeing-747 is equipped with C.V.R. & D.F.D.R. Read out of these recorders was not considered necessary for this incident.

12. Wreckage:

Not applicable.

13. Fire:

No fire occurred during or after the incident.

14. Survival Aspects:

Survival was not involved.

15. Test & Research:

Nil.

16. Observations:

- 16.1. At present the flight planned alternate airport for B-747 is Islamabad (Appendix-D2). It is located at a distance of 618 N.M. from Karachi Airport. Flight planned alternate for DC-10 & Airbus-300 is Lahore. Diversion to these two airfields costs the National aircarrier a large sum due carriage of dead weight in the form of fuel required to be consumed from the destination to the alternate in case of diversion, which is a rare phenomena. A reasonably large amount of pay load is sacrificed due to this uplift of fuel for alternate for every flight scheduled for landing at Karachi. Air carriers of other countries use Delhi, Bombay, Bahrain etc as alternate airfields.
- 16.2. The Civil Aviation Authority loses revenue when Air carriers of other countries divert to airports outside Pakistan. Reasons for such diversion is compatability of the distances and facilities. Need for developing an alternate airfield closer to Karachi to be considered.
- 16.3. The amount spent on development of an airport at a closer distance, mentioned in the preceding para, will attract foreign air carriers to designate and use this airfield for diversion. This airfield can also be used for technical landing by the schedule flights, which presently use Karachi. This will reduce traffic load on Karachi Airport. The amount invested in developing a suitably located

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alternate will be realised through landing fees etc. Additionally it will provide job opportunities to Pakistani nationals.

16.4 Weight of this aircraft when it landed Nawabshah was 229,182 KGS. Hence the LCN of this aircraft was 67 exceeding Nawabshah LCN of 53 by 1.26 times. In accordance with A.I.P. Pakistan Nawabshah has been stated as "Aerodrome for use by International Commercial Air Transport - Land". It has a concrete runway with dimensions of 9000' x 150' with bituman stopways of 900' on both ends of the runway, runway edge lights, runway threshold lights, lighted signal area, VASIS and distance Marker Boards. Shortcoming are - no parking space, limited refueling facilities and LCN of 53.

16.5. Aerodrome manual lays down at para 4.1.5.10 (ii) in part 2 - aerodrome physical characteristics chapter 4 (Appendix-E1) strength of pavement that if the aircraft LCN on the pavement in question is between 1.25 times and 1.5 times of the LCN of the pavement, upto about 300 movement may be planned. Some cracking may take place in concrete and composite pavements and there may be some local failures in flexible surfaces which will result in some increase in maintenance expenditure. It is pointed out in the manual under reference that in this case it should be assumed that the movement are spread over a period of some months.

16.6 Nawabshah runway has been used for a diversion five years ago by a wide body aircraft, which was a DC-10-30 of M/s. P.I.A.C. Therefore use of runway at Nawabshah is permissible for use after

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such a gap. No damage was caused to the runway or its lighting system by the operation mentioned above.

17.1 Investigations:

17.1. On the 7th March, 1984 at 8 A.M. M/s. P.I.A.C.

notified that their schedule passenger flight No: PK-732, operated by a B-747 from Jeddah to Karachi, had diverted to Nawabshah. The Pilot in-Command made this decision when he could not land at Karachi due poor visibility. He could not proceed to Islamabad Airport, his flight planned alternate airport, due to shortage of fuel on board the aircraft.

17.2 This flight departed Jeddah with a total of 60,500 KGS of fuel on board. In accordance with the fuel policy in force the aircraft should have had 66,500 KGS fuel. He therefore started his flight with a deficit of 6,000 KGS. (Appendix-D)

17.3 At 0305 P.S.T. on his first contact with Karachi approach PK-732 was passed Karachi weather, which was "wind calm, visibility 6 KM, weather hazy no cloud, Q.N.H.1010mb temperature 28 C⁰". The Met office at Karachi was providing rough estimates because they were not recording observation on the airside of the terminal building. Reason for not recording the observation is discussed in subsequent paragraphs. When the weather was passed to the pilot of PK-732 he was not informed that the information was not based on actual observation and they were rough estimates only. (appendix-A1).

17.4 Before this occurrence, the Met staff used to record observations at the airside of the building. They were allowed to use the door located inside the Met office to have access to the apron. On the 6th March, 1984 this door was locked under the specific instructions of the Secretary General, Ministry of Defence(App.B-1).

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After this door was locked, the Met staff stopped supply of weather reports to the Air Traffic Services of the Karachi Airport. The Senior Met Officer Karachi Airport informed S.A.T.O. that using entry other than they have been using would increase the walking distance. Consequently it would not be possible for him to supply timely information. He however informed that although he would supply the weather information, it would be rough estimates only. (App.B-I).

- 17.5 At 0335 the tower controller informed the approach controller that the visibility was 3 KM due mist and the airfield was below minima for jet circling. The approach controller did not pass this information to the aircraft. (See VHF tape extract Appendix.A-2).
- 17.6 When the aircraft reached its "Decision Height" at 0340 after completion of an I.L.S. approach on runway 25R, he was unable to establish contact with the runway. The Pilot therefore executed an over-shoot. He made one holding after the over-shoot before proceeding to his alternate airport.
- 17.7 When the aircraft was 70 N.M. out of Karachi the Pilot requested the Company Flight Operations on channel 131.6 MHZ to workout fuel requirements from over-head Nawabshah to Islamabad. Mr. Javed Kamran, the Duty Operation Controller, provided a figure of 13500 KGS, (Appendix-G1), the actual figure being 10,080 KGS. Therefore this figure was out by 2420 KGS. The aircraft had 14,020 KGS fuel when 70 N.M. out of Karachi. He was required to climb another 4, 000 feet and cover a distance of 35 N.M.

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to reach Nawabshah. The aircraft would have consumed another 1900 KGS leaving him with a figure of 12120 KGS when over-head Nawabshah at FL-290.

- 17.8. Had the aircraft continued he would have had 2040 KGS of fuel in his tanks when over-head Islamabad. He would have required 1400 KGS fuel for instrument approach procedure, leaving him with 640 KGS. He would have required some for approach leaving him with almost nothing. He therefore had no fuel for over-shoot and holding which was 6000 KGS (1000 + 5000 KGS).
- 17.9. If the Pilot had considered diverting to Lahore he would have consumed 8900 KGS of fuel out of his total of 12120 KGS when over-head Nawabshah. He would have had 3220 KGS fuel when he arrived over-head Lahore. This again was not sufficient, keeping in view fuel consumed during Instrument Procedure to land, over-shoot and holding, if required.
- 17.10 The Pilot in-Command of this schedule passenger flight was Captain M. Ahmed. He holds appointment of Chief Pilot Technical in the airline. In accordance with the airline's requirement, the Pilot holding executive appointments attends the office on full time basis. The day Captain M. Ahmed was operating this flight, he attended his office upto noon (Appendix 'H'). He reported for duty at the airport at 1630. This gave him only 4.30 hours to leave office, travel to his residence located in the Defence Officers Housing Society, change dress, take food, prepare

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for departure to airport and travel time between his residence and the airport. Calculation shows that at the best he may have had two hours at his disposal to rest.

17.11 In the morning he must have left his residence latest by 8.30 A.M. to reach his office in time. It can therefore be concluded that between 8.30 A.M. and 16.30 P.M. i.e. 8.00 hours he had only two hours time to rest before proceeding on the flight. The Pilot had consumed major portion of his duty time before proceeding on flight. It is possible that his busy schedule may have introduced fatigue element.

17.12, The Flight Crew of this aircraft reported for duty at Karachi Airport at 1630 on the 6th March, 1984. The aircraft landed Karachi Airport at 1146 hours the following day after the weather had cleared. It is assumed that a minimum of 30 minutes were taken before the crew were relieved of their duties. It can therefore be concluded that the crew may have been relieved of their duties at 1215.PST. The duty time therefore works out to be 19.45 hours. Maximum duty time is 15 hours. The crew therefore exceeded the duty hours by 4.45 hours. Duty period of 8.00 hours mentioned at para 17.8 is in addition to this.

18: Witness:

18.1 Statements of the following are placed at Appendix-B1 - B3, F1 - F3.

18.1.1. Capt. M. Ahmed	Pilot in-Command PK-732 of 6/7th March'84.
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18.1.2. Mr. Roy Patel Flight Engineer on duty on
PK-732 of 6/7th March, 1984.

18.1.3. Mr. Aftab S.A.T.O. Karachi Airport.
Ahmed Khan

19. Discussions:

- 19.1. PK-732 of 7th March, 1984 operated by B-747 bearing Nationality & Registration marks AP-AYW departed Jeddah with 6000 KGS fuel less than laid down in the Flight Operation Manual of M/s. P.I.A.C. This shortage of fuel resulted in the failure of the aircraft being able to divert to its flight planned alternate airport and its emergency landing at Nawabshah.
- 19.2. Had the Pilot not descended, made an approach and executed an over-shoot from the "Decision Height" he would have had sufficient fuel to divert to Islamabad. This situation had resulted from failure on part of the Meteorological office to provide correct weather information to the flight crew to plan their flight.
- 19.3. The Approach Controller failed to apprise the aircraft of the accuracy of weather information being passed and at no stage was the Pilot informed that the weather reports were rough estimates and these were not based on actual observations.
- 19.4. At 0305 P.S.T. the Pilot was informed by the Approach Controller that the visibility was 6 K.M. The Pilot took this as a correct report. He commenced his descent to make an approach at Karachi at 0313 P.S.T. Had he known the correct position that the weather report was rough estimates, he may have re-checked weather with the A.T.C. prior to commencing his descent. Even at 0335 PST when the Aerodrome

Controller informed the Approach Controller that the airfield was below minima for jet circling (Appendix A-2), the Approach Controller failed to pass this information to the Pilot of PK-732. This therefore shows failure on the part of the Approach Controller. However at this stage of the flight passing of the weather would have made no difference to the outcome.

- 19.4. It is evident from the Pilot in-Command's request made to the Duty Operation Controller to work out the fuel requirement for alternate airfield that the flight crew had not planned for the eventuality of a diversion. Otherwise they themselves would have known this requirement.
- 19.5. The Duty Operation Controller informed the Pilot that Boeing-747 will consume 13,500 KGS fuel at FL-290 from over-head Nawabshah to Islamabad (Appendix-G1) The aircraft would have actually consumed 10800 KGS. The figure provided was out by 2700 KGS. This indicates that Mr. Kamran Mirza, the Duty Operation Controller, showed carelessness in calculation of fuel requirement.
- 19.6. The Pilot initially intimated the Air Traffic Control that he was diverting to Islamabad. This decision was based on the fact that Islamabad was the flight planned alternate airfield. Since it was designated by the airline as alternate, he should have had enough fuel to reach Islamabad. However after comparing fuel available on board the aircraft with the figure supplied by the Duty Operation Controller in respect of fuel required to proceed to Islamabad from over-head Nawabshah,

the Pilot decided to return to Karachi if the weather had improved by then. Decision taken by the Pilot was correct.

- 19.7. Since the visibility at Karachi had not improved, the Pilot decided to divert to Nawabshah. This decision to divert to Nawabshah was also correct. Proceeding to any other airfield at this stage may have resulted in a serious occurrence.
- 19.8. Fuel policy of M/s. P.I.A.C. has been revised in consultation with the Chief Flight Inspector of the C.A.A. Pakistan. Fuel carried in accordance with the new policy introduced, which is adequate, will be less than provided in the previous fuel policy. This will reduce the amount of dead load carried by the aircraft in shape of diversion fuel on each flight.
- 19.9. In accordance with page 483 of the Flight Operation Manual of M/s. P.I.A.C. flight PK-732 was despatched from Jeddah with 6,000 KGS less fuel. In accordance with page 919 of the same Manual the aircraft departed Jeddah with 4,700 KGS less fuel. Difference in the figures mentioned above are not understandable. Having two fuel policies in the F.O.M. is confusing and this requires correction.

20. Findings:

- 20.1. The pilots and the Flight Engineer were properly certificated.
- 20.2. The aircraft held valid C of R, C of A and C of M.
- 20.3. The aircraft was properly maintained.
- 20.4. Met Office was not recording actual observation on the airside of the terminal building. Therefore they provided weather reports which were rough estimates. They displayed an irresponsible attitude.

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- 20.5. The Approach Controller did not inform the Pilot that the weather reports were rough estimates. The Approach Controller also did not inform the Pilot when the airfield was declared below minima for jet circling.
- 20.6. Duty Operation Controller of M/s. P.I.A.C. showed carelessness in calculation of fuel required from over-head Nawabshah to Islamabad.
- 20.7. The aircraft departed from Jeddah with a deficit of 6,000 KGS of fuel.
- 20.8. The fuel policy in-force was not implemented properly.
- 20.9. Fuel policy appears at page 483 and page 919 of the F.O.M. There is difference in both which causes confusion.
- 20.10. Fuel policy has been revised.
- 20.11. Occasional use of an airfield by aircraft LCN of which is not more than 1.50 times of a runway is permissible.
- 20.12. Facilities at Nawabshah received certain damage due to operation of Boeing-747.
- 20.13. Need exist for a diversion airport at a closer distance to Karachi.
- 20.14. Crew of this flight exceeded duty time by 4.45 hours.
21. Cause: The aircraft diverted to Nawabshah because of failure of the airlines to despatch the aircraft with adequate fuel for flight planned alternate airport.
22. Recommendations:
 - 22.1 The airline should continue to monitor the fuel remaining after each flight. A report to this effect be submitted to the C.A.A. Pakistan by M/s. P.I.A.C. during the first week of every month

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so that changes to the fuel policy approved on 25.3.1984 could be made if necessary.

- 22.2. Action be considered against those who were concerned with the despatch of PK-732, which departed Jeddah on the 6th March, 1984, for their failure to ensure provision of adequate fuel in accordance with the policy in force.
- 22.3. Suitable action be taken by M/s. P.I.A.C. against Mr. Kamran Mirza, the Duty Operation Controller for carelessness displayed by him in calculation of fuel required.
- 22.4. To avoid confusion, the airlines should ensure that fuel policy should appear in only one section of their Flight Operation Manual.
- 22.5. Damage caused due to operation of PK-732 to facilities at Nawabshah be recovered from M/s. P.I.A.C.
- 22.6. M/s. PIAC must ensure that before every flight their crew have taken rest as laid down under the rule.
- 22.7. Duty Approach Controller be warned for his failure to inform the Pilot that weather information provided was estimated, and for his failure to pass information that the airfield was below minima for jet circling.

22.8 Consideration be given to develop an airfield closer to Karachi to serve as an alternate airport having capabilities to accommodate wide body aircraft of all categories.

22.9 The Ministry of Defence be requested to take action against Met Staff involved.
