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AIRCRAFT INCIDENT INVESTIGATION

F-27 AP — BCZ

WHICH OCCURRED ON
21ST SEPTEMBER 1991

AT

QUAID-E-AZAM INT'L AIRPORT

CIVIL AVIATION AUTHORITY
KARACHI PAKISTAN

AIRCRAFT ACCIDENT INVESTIGATION

GEAR UP LANDING INCIDENT TO PIA F-27 AIRCRAFT AP-BCZ-WHILE
OPERATING TRAINING FLIGHT ON 21ST SEPT. 1991, AT
QUAID-E-AZAM INT'L AIRPORT KARACHI

Authority: Director General Civil Aviation Authority
Memorandum No. HQCAA/ 1901/ 139/ AIB dated 21st
March 1991 (App. "A")

COMPOSITION OF INVESTIGATION TEAM

- | | | |
|-----|---|-----------------------|
| (a) | Air Cdre. (R) Abdul Basit
Chief Inspector &
President AIB, CAA. | Investigator Incharge |
| (b) | Gp. Capt. (R) Rashid A. Chaudhry
Flight Inspector (Pilot) | Investigator |
| (c) | Mr. Altaf Hussain
Sr. Airworthiness Surveyor | Investigator |
| (d) | Capt. Amjad H. Faizi
Chief Pilot Corporate
Safety PIAC | Co-opted member |

1. AIRCRAFT INFORMATION

1.1. Registration Marking AP-BCZ

1.2. Aircraft type & maker's S. Nos.	F-27 S/N 10305
1.3. Engine types, airframe positions and maker's S. Nos.	R.R. DART 532-7E #1 S/N 13254 TSO 2229-30 #2 S/N 13193 TSO 2614-33
1.4. Certificate of registration No. and Validity.	No. 600 - Valid
1.5. Certificate of Airworthiness Nos. and date of expiry	No. 553 - Valid till 15.9.1992
1.6. Certificate of Maintenance date of issue and period of validity	C of M issued on 13.9.1991 23.9.1991
1.7. Date of construction of airframe.	August 1966
1.8. Name and address of owner	PIAC, PIA Head Office Karachi
1.9. Gross weights. Maximum permitted by C of A for this flight, at the time of accident.	Within limits Within limits
1.10. Loading. Centre of gravity limits in C of A and centre of gravity position at the time of accident and commencement of flight	Within limits

1.11. Airframe history (Give flying time since manufacture, last overhaul and last periodic check. List also essential modifications completed).

TSN 54386-51 | POSN
total lndgs 60792
19.9.91
No essential
modifications
outstanding

1.12. Engine history. (Give flying time since manufacture, last overhaul and last periodic check. List also essential modifications completed)

TSI 18|32
#ENG TSO 2229 - 30
S/N 13 254 TSN 39900-
27
TSI-1610-19
#2 ENG TSO-2614-33
S/N 13193 TSN 34976-52

2. CREW INFORMATION

2.1. Pilot-in-Command

2.1.1. Name : Capt. Qamar Habib

2.1.2. Position in the Cockpit. : Captain

2.1.3. Date of Birth : 30.5.1955

2.1.4. Type of Lic. and No. : ALTP No. 667

2.1.5. Medical date with status : 27.5.91 - Fit for
renewal of ALTP Lic.

2.1.6. RATINGS

- 2.1.6.1. Type(s) held : F-27, B-707/B-720,
A-300
- 2.1.6.2. Type current : F-27
- 2.1.6.3. Flt. Instructor : F-27
Rating
- 2.1.6.4. Flt. Engineer -
Instructor Rating
- 2.1.6.5. Check Rating : Check Captain

2.1.7. FLYING EXPERIENCE

- 2.1.7.1. Grand total : 6477:40
- 2.1.7.2. Total in Command : 921:20
- 2.1.7.3. Total in command/ : 621:00
Co-Pilot/Flt Engineer
on the type accident/
incident occurred.

2.1.8. Where trained : PIA

2.2. UNDER TRAINING PILOT

2.2.1. NAME : ABID HASSAN
2.2.2. Position in the Cockpit : Trainee Pilot

2.2.3. Date of Birth : 14.1.1959

2.2.4. Type of Lic. and No. : CPL No. 1566

2.2.5. Medical date with Status : 6.7.1991 - Fit for
CPL Renewal

2.2.6. RATINGS

2.2.6.1 Type(s) Held : Cessna-172

2.2.6.2. Type Current : Cessna-172

2.2.6.3. Asstt/Flight : -
Instructor Rating

2.2.6.4. Flight Engineer : -
Instructor Rating

2.2.6.5. Check Rating : -

2.2.7. FLYING EXPERIENCE

2.2.7.1. Grand Total : 524:30 Hours

2.2.7.2. Total in Command : 344:00 Hours
2.2.7.3. Total in Command/ -
Co-Pilot/Flight Engineer
on the type accident/
incident occurred.

3. SUMMARY

3.1. F-27 aircraft Registration Mark AP-BCZ was being operated on a training flight performing circuits and landings at Quaid-e-Azam International Airport, Karachi on 20th September 1991. The aircraft blocked off at 1715 Z with four ab-initio Cadet Pilots and a training instructor. The instructor carried out training of two Cadet Pilots which included 2 NDB let downs and 14 landings. Having taken on the training of the third cadet Pilot which included three landings and an NDB let down, the aircraft was radar vectored for adjustment as No. 3 in the traffic and to accommodate two arriving aircraft. During this approach, the training Captain decided to simulate main D.C. failure landing, which in an actual case is either a no flap landing or flaps are required to be lowered manually. Since Karachi Runway is long, a no flap without lights landing was preferred. As this aircraft was placed on long finals, the instructor pilot elected to lower the gears at a later stage. However, during the approach, both the student and the I.P. got involved in maintaining the aircraft on the glide path and imparting instructions that they forgot to lower the gears. The aircraft touched down on its belly at approximately 4000' down the runway slightly to the left of centre line. It had then skidded straight for about 2000' and stopped without tilting on either side. There was no fire or any injury to its occupants.

4. INJURY TO PERSON (S)

4.1. No injury was caused to any person on board the aircraft or outside as a result of the incident.

5. DAMAGE TO AIRCRAFT

5.1. The aircraft under surface of the fuselage was badly damaged due to friction with the runway.

5.1.1. Damage report at Appendix 'H'.

6. OTHER DAMAGES

Nil.

7. METEOROLOGICAL CONDITION

7.1. Met report at Appendix D 1 to D 3. Weather was not a factor.

8. NAVIGATION & LANDING AIDS (VISUAL/NON-VISUAL)

8.1. Navigation & Landing aids were available and serviceable at the time of incident. They were not a factor in the incident.

9. COMMUNICATIONS (INCLUDING RADIO COMMUNICATION)

9.1. All Communications were available and serviceable at the time of incident.

9.2. These were not a contributory factor in the incident.

10. AERODROME AND GROUND FACILITIES

10.1. All Aerodrome and ground facilities were available.

11. FLIGHT RECORDERS

11.1. Flight Recorder was removed from the aircraft and was sent to PIAC maintenance for read out.

12. WRECKAGE & IMPACT INFORMATION

12.1. The aircraft was found on the runway 25R slightly left of the centre line about 6000' down the runway. The gears were up and the aircraft had not tilted on either side.

13. FIRE

13.1. There was no fire during or after the incident.

14. SURVIVAL ASPECTS

14.1. It was a survivable incident. No injury was caused to any person on board or outside the aircraft. Exit was made through the normal exit.

15. TEST & RESEARCH

15.1. All aircraft equipment were checked and found serviceable.

15.2. Details at para - 17.

16. OBSERVATIONS

16.1. As per flight training syllabus each exercise is of 2:00, at present total flight training time is 14:00 hours. However, as per training policy (Ops. Manual) each flight training exercise is to be of 1:20 hours flight time and the total flight training syllabus caters for 8 hours only including two hours night flying time. Thus there is a contradiction and anomaly in PIA training policies which need to be reviewed. The existing policy does not have the CAA's approval.

16.2. Capt. Qamar Habib P. No. 40441 was scheduled to fly training missions (four hours duration) consecutively from 20th August 1991 to 20th September 1991 (last 30 days) that too at night and he logged 74 hours of flying (53 hours Instructional and 21 hours line Under Supervision). Long instructional flying mission with ab-initio, at night time are undoubtedly demanding and would cause accumulated fatigue, burden, inefficiency and lower reaction-cum-alertness capability.

17. DISCUSSION OF EVIDENCE

17.1. Training Statistics show that most accidents (about 80%) occur during the take off and landing phase of the flight. This is the envelope where maximum concentration is required from the crew. The Instructor Pilot being an inexperienced instructor was handed over a task to train ab initio cadets

during the night. A formidable task for even an experienced pilot as it would require situational awareness for a long period of time. Any lapse of concentration would result in a mishap. Work load intensity is maximum during the take-off and landing phase of the flight. Captain Qamar having flown with two cadets earlier was training the third Cadet Pilot. In this period, he had made 17 landings and 3 NDB let downs. He being an inexperienced pilot having to work harder compared to an experienced instructor must have felt fatigued which resulted in lapses in his concentration. The night flying phase demands much more skill and work load from a pilot than during the day. The training was being done at such late hours as 1:20 A.M. local time.

- 17.2. The repetitive exercise of NDB let downs and circuits and landings probably made the Instructor Pilot lose the concept of the situational awareness. Most actions taken by a Pilot while flying are based upon experience. The experience allows one to solve problems more quickly and accurately and, therefore, to devote more time and attention to other requirements. During the final approach, the I-P and the student became so engrossed in maintaining the aircraft on the glide slope, that they both forgot to lower the landing gears. Had the Instructor Pilot been more experienced the chances are that he may have attended to the pre-landing check list and lowered the gears.

17.3. **FINAL APPROACH AND LANDING** Pilot error accidents are the result of a chain of events that culminate in a mishap. In the last approach before the accident, Capt. Qamar decided to simulate DC bus failure emergency. In this emergency, the landing lights are not available. Moreover, the flaps are lowered manually or a flapless landing is made. As Karachi runway is 10,000' long, the Pilot opted to make a flapless approach and landing. This approach was also being radar vectored to adjust two other aircraft which were positioned ahead of this particular aircraft. In order to position as number three in the traffic Capt. Qamar had to make a longer than normal final approach so he delayed lowering the landing gear and completing the pre-landing check list. Being a flapless landing the power would not be required to be brought back sufficiently for the gear warning horn to activate. Due to simulation of DC bus failure, the pilot was making a no light landing. So two warnings which under normal circumstance would have been available i.e. warning horn and landing lights, were not available.

17.4. The placement of the aircraft in an abnormally wider circuit and longer than usual finals also made the pilot delay performing the pre-landing check list. However, on the final approach the I-P got so engrossed in pattern that he completely forgot to carry out the pre-landing check list that he had delayed deliberately and thereby failed to lower the gears. As there was no gear warning available to him because of simulation of D.C. bus failure, and no

landing lights, the pilots should have ensured the completion of pre-landing checklist. The chain of events and all factors discussed in this para put together, contributed to the cause of this accident.

- 17.5. **MINIMUM FLIGHT CREW** F-27 Flight Crew Operators Manual limitatons Page B-10 para 8 states that the minimum flight crew required for performing functions necessary to comply with the airworthiness requirement is two (2) which is:-

(a) One Pilot.

(b) One Co-Pilot.

- 17.6. This training flight did not have a qualified Co-Pilot on board. The aircraft was unairworthy as it did not meet the minimum aircrew requirement.

Rules 24 and 25 of Civil Aviation Rules 1978 among other things requires that an aircraft given a certificate of Airworthiness must conform to Flight manual requirements.

- 17.7. Since the aircraft was not being operated under the conditions specified in the flight crew operators manual for F-27 type of aircraft, a violation of rule 24 and 25 of Civil Aviation Rules was being committed. Chief Pilot Training PIAC should have ensured that this training flight had a proper crew compliment on board.

- 17.8. The need for a rated Co-Pilot being on board becomes all the more necessary in the event the Captain for any reason becomes incapacitated. In such a case the Co-Pilot can take over and bring the aircraft back safely. Moreover a rated Co-Pilot occupying a jump seat in the cockpit may have noticed the landing gear up and could have warned the Captain to lower them before touch down.
- 17.9. **TRAINING SYLLABUS** Flight Training Syllabus for F-27 aircraft in PIAC has not been defined clearly. Instead exercises mentioned in the flight simulator syllabus are being followed during flight training. This is not desirable as training performed in Flight Simulators is of a different nature. A syllabus clearly defines the purpose of the exercise, the time to be spent on each exercise and the level of proficiency required from the student. **The training syllabus** being followed includes only **two hours of night** flying training, whereas, in PIAC the entire flight training is being conducted at night. This too is being conducted at late hours i.e. between 10 P.M. to 2 A.M. the contention being that if a pilot can fly at night, he can therefore, fly during the day time. However, on the contrary, this arrangement has been made as PIAC has aircraft available during this time period, as there are no scheduled flights then. Most of the pilots inducted in PIA are CPL holders with 250 hours of flying experience on small aircraft like Cessna 150 or 172. Flight training on a complex F-27 type of aircraft is a big jump for these pilots. It would therefore, be appropriate that their

experience be built up gradually to take on Airline scheduled flights. The training should first be conducted during the day when all visual references are available to the trainee pilot till he attains a certain level of proficiency. The night phase which is a demanding phase should be kept for the end as by then the trainee would have achieved enough proficiency to concentrate on all aspects of the flight training.

- 17.10. Capt. Qamar Habib P. No. 40441 was scheduled to fly training missions (four hours duration) consecutively from 20th August to 20th September 1991 (last 30 days) that too at night, and he logged 74 hours of flying (53 hours Instructional and 21 hours line Under Supervision). Long Instructional flying missions with abinitios, at night time are undoubtedly demanding and would cause accumulated fatigue, boredom, inefficiency and lower reaction-cum-alertness capability.

18. FINDINGS

- 18.1. The Flight training manual, in fact almost all the manuals viz-a-viz F.C.O.Ms. of F-27 and B-707 aircraft and operations manual, were last reviewed/updated in mid. seventies.
- 18.2. The training syllabus for P-I & P-II ratings on F-27 aircraft is not defined. At present flight training syllabus is the same as the Simulator training syllabus. This too does not have the CAA's approval.

- 18.3. The training syllabus being followed includes only two hours of night flight training, whereas, in PIAC, the entire flight training is being conducted at night, that at late hours viz-a-viz between 10 P.M. to 0200 A.M.
- 18.4. F-27 aircraft is certificated to be flown by a team of two qualified cockpit crew (at least one of them has to have P-I rating on the type irrespective of the type of mission). This aircraft (AP-BCZ) was scheduled and authorised to be flown with only one rated pilot on board. This constituted flying an non airworthy aircraft according to laid down rules as there was no qualified F/O detailed to accompany the Instructor Pilot (the Capt. of the aircraft).
- 18.5. Flight Instructors training syllabus does not exist, in PIAC, for any aircraft. The Instructor Pilots training merely constitutes achieving proficiency on the type from the right seat only.
- 18.6. Neither the Chief Pilot Training nor the Chief Pilot Planning and scheduling were aware of the training syllabus.
- 18.7. In the absence of a formalised flight Instructors' training course, the Inspector Pilots are given a few hours of flying from the R.H. seat for their P-I Rating and are then allowed to start imparting flight instructions more like a safety pilot.

- 18.8. There is a complete lack of standardisation. Under Supervision flying of F/O's is conducted by any Capt. irrespective of whether one holds a supervisory assignment viz-a-viz simulator/flight instructor.
- 18.9. The CVR reproduction is so heavily distorted and garbled that its very purpose of being installed is lost.
- 18.10. Capt. Qamar Habib, had recently completed his flight instructor's training.
- 18.11. Since early 1990 PIA has stopped training its Cadet Pilots on the F-27 simulator due to non-availability of F-27 simulator owned by M.A.S. at Kuala-Lumpur Malaysia. It resorted to the use of F-27 aircraft for converting the Cadet Pilots. Line Flying for basic training is known the world over to be a costly and unsafe venture as compared to a phase-II simulator. It holds good for all types of aircraft. Therefore, PIA must look for a F-27 simulator to train its Cadet Pilots.
- 18.13. PIAC does not have enough training effort to carry out training of a large batch of Under Training Pilots. Their induction of 64 cadet pilots in one batch at one time adversely affects the standard of training.
- 18.14. The aircraft F-27 AP-BCZ was certificated, equipped and maintained in accordance with CAA requirements.

- 18.15. The aircraft was correctly refueled and properly loaded for the subject flight. The C.G. position and landing weight were within limits.
- 18.16. The aircraft landed with landing gear retracted on runway 25R at 2025Z hours. The touch down point was approximately 4000' from the beginning of runway 35.
- 18.17. No injury was caused to any passenger or third party.
- 18.18. The flight crew failed to select the landing gear down. There were no defects in the landing gear system.
- 18.19. The wreckage of F-27 AP-BCZ blocked the runway at Q.I.A.P. Karachi till 210149 UTC.
- 18.20. No fuel leaks occurred and there was no fire before or after the incident.
- 18.21. The aircraft AP-BCZ was not airworthy as it did not have a proper crew compliment (rated Co-Pilot not on board, see F.C.O.M. Page B-10 para-8).
- 18.22. Because of the Runway being blocked loss of revenue was incurred by CAA due to diversion.
- 18.23. The Captain of the aircraft Qamar Habib flew approximately 75 hours in the last 30 days before the incident. This includes 53 hours of instructional flying most of which was at night.

- 18.24. Capt. Qamar Habib was required to train four Cadet Pilots at night. At the time of occurrence third Cadet Pilot Abid Hassan was being trained.
- 18.25. Capt. Qamar Habib as Pilot-in-Command failed to ensure that the landing checklist was accomplished as required by the S.O.Ps. of F-27 aircraft and was thus in breach of Rule 272 (4) of CAR 1978 which reads, "The Pilot-in-Command will ensure that the flight check system is carried out in detail".
- 18.26. After having failed to lower the gears at the correct point of approach, the approach was continued and the Captain despite having been asked by the duty ATCO failed to check the gears down and locked when asked by the A.T.C. to "Recheck landing gear".

19 **CAUSE**

- 19.1 The cause of the accident is that the Pilot during approach and landing failed to follow the correct procedures laid down in the PIAC Flight Crew Operators Manual by not performing the pre landing check list and failing to lower the landing gears at the recommended point.
- 19.2. The contributory factors being inexperience, fatigue, night conditions and no qualified Co-Pilot on board.

20. RECOMMENDATIONS

20.1. In view of the findings in this investigation and the observations made by the Investigators, the following recommendations are made:-

20.1.1. PIAC should arrange to adopt a comprehensive training course for its pilots who are recommended to function as instructors on its fleet. The syllabus of such a course should be submitted to CAA for its approval.

20.1.2. Final selection of each new instructor will be the responsibility of CAA who will accord its approval after evaluating the potential of each instructor, specifically into areas like suitability, teaching skills and knowledge of the aircraft.

20.1.3. PIA's Management must take proper steps to ensure adherence to S.O.Ps. at all times especially during training flights.

20.1.4. PIA Management must arrange to up-date and review all the manuals (training, operations and F.C.O.M.), training syllabii, and cockpit crew training policies which have become out-dated and redundant. All such syllabii and policies may be submitted to CAA for approval by 31st March 1992.

- 20.1.5. Cockpit crew technical training syllabii viz-a-viz long and short refresher courses must be devised and end of course examination must be held by the P.T.C. to make these courses more realistic and effective.
- 20.1.6. PIA's Flight Training Programme of scheduling for the Cadet Pilots, must be so adjusted that no more than the time prescribed in the syllabus (02 hours) is flown at night, for better and safer flight training.
- 20.1.7. PIA must train the Cadet Pilots on a Phase-II simulator and stop conducting basic flight training on the line i.e. on the F-27 aircraft directly. CAA to approve the simulator. To be implemented by maximum 31st March, 1992.
- 20.1.8. Penalties in the form of fines must be imposed on operator's for failures to comply with CAR 1978. The sanctions in the form of fines presently contained in CAR 1978 are antiquated and require to be reviewed and increased to realistic amounts.
- 20.1.9. Main D.C Bus failure constitutes a major electrical failures situation, thus it should not be practiced as a routine exercise during night training mission as per PIA training policy.

20.1.10. Disciplinary action under the Civil Aviation Rules 1978 be instituted against Capt. M. Iqbal (ALTP NO. 167) Chief Pilot Training, for having allowed the operation of training mission, on F-27 aircraft, without having met the minimum flight crew requirements. He is guilty of violation of Rule 251(9) and Rule 134 and 135(b) and (e) of CAR 1978.

20.1.11. Disciplinary action under the Civil Aviation Rules 1978 be instituted against Capt.Qamar Habib P.No.40441 for having operated the aircraft negligently by failing to ensure that the flight check system was carried out in detail and failure to follow the Standard Operating Procedures. Rule 155(I), 251(9) and 272(4) of CAR 1978 are applicable.

20.1.12. CAA must establish its Flight Standards Division for an effective regulatory control over the Airlines functions, particularly the operations, through its own Flight Inspectors.

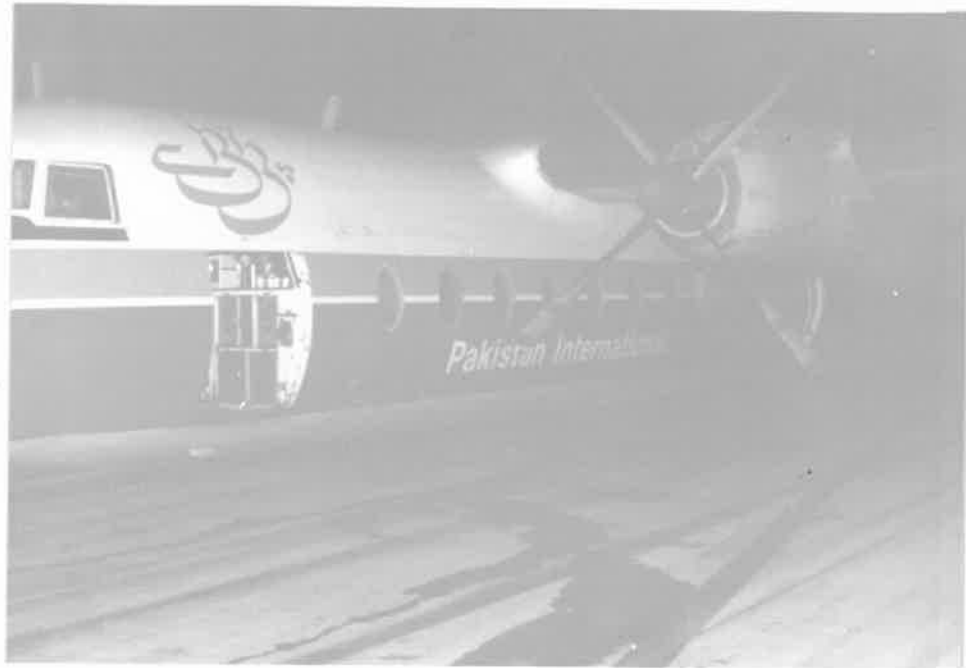


APP 'B1'



APP 'B2'

APP 'B3'



APP 'B4'





APP 'B5'



APP 'B6'