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AIRCRAFT ACCIDENT INVESTIGATION REPORT

PIA FOKKER F-27 AP - AUX
NEAR PESHAWAR INTERNATIONAL
AIRPORT
ON
23RD OCTOBER 1986

**CIVIL AVIATION AUTHORITY
KARACHI, PAKISTAN**

AIRCRAFT ACCIDENT INVESTIGATION REPORT

FATAL FLYING ACCIDENT INVOLVING PAKISTAN INTERNATIONAL
AIRLINES FOKKER F-27 AIRCRAFT REGISTRATION AP-AUX THAT
OCCURRED 2.5 NAUTICAL MILES SHORT OF THE THRESHOLD OF
RUNWAY 35 PESHAWAR INTERNATIONAL AIRPORT ON 23RD OCT.,
1986 AT 2049 HRS (PST) WHILST THE AIRCRAFT WAS OPERAT-
ING SCHEDULED DOMESTIC PASSENGER FLIGHT PK-672 FROM
LAHORE TO PESHAWAR

Authority: Government of Pakistan, Ministry of Defence
(Aviation Division) letter dated Karachi the
26th October, 1986 (Appendix "A")

COMPOSITION OF INVESTIGATION TEAM

- | | |
|---|------------------------|
| 1. Air Commodore (Retd),
P.D.Callaghan,
Adviser Flight Safety,
Civil Aviation Authority. | Investigator-in-Charge |
| 2. Wing Commander,
Zaheer H.Zaidi,
Pakistan Air Force, | Investigator |
| 3. Mr.Taj Mohammad,
Senior Airworthiness Surveyor,
Civil Aviation Authority. | Investigator |
| 4. Squadron Leader (Retd),
S.Sajjad Noor,
Manager Flight Safety,
PIA. | Investigator |

TERMS OF REFERENCE

- (a) Establish the cause of the accident.
- (b) Assess the extent and cost of damage to the aircraft
and other facilities/property.
- (c) Apportion blame, if any.
- (d) Recommend measures to avoid recurrence.

SYNOPSIS

On 23rd October, 1986, Pakistan International Airlines Fokker F-27 aircraft Registration AP-AUX operating scheduled domestic passenger flight No. PK-672 from Lahore to Peshawar, departed Lahore International Airport at 1907 hrs Pakistan Standard Time (P.S.T.) with 54 souls on board (39 adults, 5 children, 5 infants, 3 cockpit crew and 2 cabin staff). The cockpit crew on board consisted of a Pilot-in-Command, a Co-pilot under route-check, and an additional Co-pilot. The same cockpit crew had boarded the aircraft at Islamabad International Airport and had operated to Peshawar, then to Lahore with the Co-pilot under-route-check flying the aircraft and the Captain monitoring, and an extra Co-pilot as an observer. On the Flight from Lahore to Peshawar the Co-pilot under-check was flying the aircraft as had been the case on the earlier flights. The flight from Lahore was uneventful and the Captain reported over the Peshawar V.O.R. (Very High Frequency Omni-directional Range) at 9,500 feet at 2030 hrs (P.S.T.). At this time a V.O.R. let down procedure was commenced/(see Appendix "B" for the Peshawar International Airport V.O.R let down procedure chart). During this let-down-procedure at 2040 hrs (P.S.T.) whilst his position as 8 DME (Distance Measuring Equipment) from the V.O.R and informed the ATC that there was firing from the ground about two miles to his left, with tracers reaching almost to his height. At this time the aircraft was descending from 5,500 feet to 3,500 (the height above the airfield level was between 4,320 feet and 2,320 feet). Air Traffic Control (A.T.C.) Peshawar advised the pilot to turn right and join for an approach to runway 17. The Captain informed A.T.C. that the firing was not effecting him, and he had only reported it for information, and he elected to continue the let down and approach for a landing on Runway 35. He at the same time informed ATC that he had switched off all his external lights. Subsequent radio communication between the aircraft

/and ATC

and ATC was normal upto the last transmission heard from the aircraft which was "Roger Clear to Land" in response to the ATC final clearance for landing. The last transmission from the aircraft was at 20.49 "27.2". All transmission from the aircraft were normal, and no defects/emergencies were reported. The aircraft impacted the ground at 120 to 125 knots about 2.5 nautical miles short of the threshold of Runway 35 on a radial of 182 degrees from the threshold at 20 hrs 49 minutes 31.5 seconds i.e. 4.3 seconds after the last transmission. As a result of the accident, the Captain the Co-pilot flying, the steward and the Air Hostess sustained fatal injuries, and the second Co-pilot sustained serious injuries. Of the passengers, nine sustained fatal injuries (Two Air Guards, Four adult passengers and three infants). 27 passengers sustained injuries as a result of the accident, of these seven were released after first aid, and 20 were hospitalised with injuries ranging from abrasions, lacerations, head injuries and fractures. (See Appendix "D" for details of injuries to survivors). Thirteen passengers survived the accident without injury except for minor abrasions.

The empennage of the aircraft was damaged on first impact at 120 to 125 knots, and though still attached to the fuselage by cables and some fuselage skin, became ineffective aerodynamically. This caused the aircraft, which bounced into the air still with flying speed after first impact, to pitch nose down sharply. The aircraft then impacted the ground nose first and went onto its back, skidding a short distance on its back before coming to rest inverted. Except for the Air Hostess and possibly the Flight Steward who may have sustained injuries at the time of initial impact, most of the injuries sustained by the flight crew and passengers were on second impact and subsequently.

The investigation team after reviewing all the available evidence are of the opinion that the cause of the accident was "Human Failure" which resulted from failure of the crew flying the aircraft to monitor the height of the aircraft after descending through the Minimum Descent Altitude of 400 feet above runway level. The Captain failed to assume control of the aircraft from the Co-pilot, who was unable to intercept the approach radial and distracted himself from monitoring the height by attempting to talk the Co-pilot into correcting his approach and thereby allowed the aircraft to be flown into the ground. There was no evidence of airframe or engine failures prior to first impact. The crew were communicating with each other and the ATC normally till moments before the first impact. (See Appendix "E₁" and "E₂" for transcripts of the ATC and Cockpit Voice Recorder Tapes).

1. AIRCRAFT INFORMATION

1.1. Aircraft type	Fokker F-27
1.2. Registration	Manufacturers S.NO.10335 AP-AUX
1.3. Engine type and Installation	Rolls Royce Dart 532-7 Two engines, one mounted on each wing. Port S.No.8211 Stbd.S.No.446
1.4. Certificate of Airworthiness	356/Rev.1 (Valid)
1.5. Certificate of Registration	398/Rev.1 (Valid)
1.6. Certificate of Maintenance	Valid upto 27-10-86
1.7. Configuration	44 Economy Seats
1.8. Center of Gravity at take off from Lahore	29% M.A.C (Within Limits)
1.9. Date of construction (Airframe)	12th August, 1967

/1.10.Weight

- | | |
|---|--|
| 1.10. Weight permissable by Chief of Airworthiness. | 43,500 Lbs |
| 1.11. Weight at time of accident. | 37,467 Lbs |
| 1.12. Airframe hours since new. | 39,725:05 hrs |
| 1.13. Total landings since new. | 45,386 |
| 1.14. Hours since airframe overhaul. | 3,529:05 |
| 1.15. Modification status airframe | None outstanding. |
|
1.16. Engine Hours | |
| 1.16.1. Port since new | 36,539:34 hrs |
| 1.16.2. Stbd.since new | 25,322:25 hrs |
| 1.16.3. Port since overhaul | 4,610:11 hrs |
| 1.16.4. Stbd.since over-haul | 1,017:28 hrs |
| 1.17. Modification status engines. | None outstanding. |
| 1.18. Propeller Type. | Dowty, four bladed, constant speeding, fully feathering. |
| 1.18.1. Port S.No. | DRG - 139-64 |
| 1.18.2. Stbd.S.No. | DRG - 284-63 |
| 1.18.3. Port hours since new. | 21,732:06 |
| 1.18.4. Stbd. hrs since new. | 13,617:18 |
| 1.18.5. Port hrs since overhaul. | 1,087:06 |
| 1.18.6. Stbd. hrs since overhaul. | 852:18 |
| 1.19. Modification status propellers. | None outstanding. |

2. CREW INFORMATION

2.1. There were three cockpit crew and two cabin staff on board the aircraft to operate the flight. Details are as follows:

- 2.1.1. Pilot-in-Command
1. Capt.Raza Zaidi P.NO.37512
 2. ALTP Licence No. 635
 3. Medical Status: - Fit
 4. Total Command - 1360:00
hours F-27
 5. Captain since - 13-7-84
 6. Appointed Route - 9-9-86
check Captain.
 7. Flying during - 188 hrsr
the preceding
90 days.
 8. Rest availed - 19:40 hrs
prior to opera-
ting on 23-10-86
 9. Last date landed 30-9-86
at Peshawar at
night.
 10. Control seat - Left
occupied during
accident flight.
- 2.1.2. Co-Pilot (Under
Check) on
aircraft controls.
1. F/O Manzar Masood P.NO.45612
 2. C.P.L. NO. 911 (Valid
and endorsed for P-2 on the
F-27 aircraft).
 3. Control Seat occupied
during accident flight- Right
 4. Medical Status - Fit
 5. Total under super-
vision P-2 hours
since posting to
Islamabad. - 98:42

6. Joined Islamabad - 20-8-86 Base.
7. Flight training - 20:55 hrs on F-27 at Karachi.
8. Under Supervision - 25.00 hrs hrs prior to endorsement of CPL.
9. Total flying - 144:37 hrs experience on the F-27 aircraft.
10. Rest availed prior 20:50 hrs to operating on 23-10-86.

2.1.3. Co-Pilot (Qualified for Independent P-2 operation. Observer)

1. F/O S.Rehan Ahmed P.No.45620
2. CPL No.810 (Valid and endorsed for P-2 on F-27 aircraft).
3. Seat designated - Jump seat during accident (observers flight. seat).
4. Medical Status - Fit
5. Total P-2 hours - 83:00 hrs on the F-27 aircraft.
6. Joined Islamabad - 1-9-86 Base after completion of Flying Training and 25, under supervision hrs at Karachi.
7. Rest availed prior to operating on - 66 hrs accident flight.

2.1.4. In addition to the above mentioned cockpit crew there were two cabin staff operating the flight namely:-

2.1.4.1. Flight Steward Amjad Choudhry Staff No. 42897
Emergency and Flight Service Procedure
Certificate No.518

/2.1.4.2. Air Hostess

2.1.4.2. Air Hostess Miss Almas Hameed
Staff No. 44323
Emergency and Flight Service 522
Procedures Certificate No.

3. PASSENGERS AND LOAD INFORMATION

3.1. Total number of Passengers on board the aircraft during the flight from Lahore were 49. Their breakdown is as follows:-

3.1.1. Economy Class - 49 (Adults 39; Children 5; Infants 5) (of the 39 adults two were air guards).

3.2. Aircraft load information is as follows:-

3.2.1. Weight of Passengers 2988 Kg.

3.2.2. Weight of Passengers 355 Kg. Total (200 Kg. baggage and Cargo. Passenger baggage : 155 Kg. Cargo)

4. HISTORY OF THE FLIGHT

4.1. Pakistan International Airlines Fokker F-27 aircraft Registration AP-AUX was scheduled to operate a series of domestic passenger flights on 23rd October, 1986. The flights were PK-636 from Islamabad to Peshawar; PK-673 from Peshawar to Lahore; and, PK-672 from Lahore to Peshawar. The flight crew originally scheduled for this series were Captain Basharat as Pilot-in-Command with First Officer Rehan Ahmed as Co-pilot. However, due to unavoidable circumstances Captain Basharat was required to operate an earlier flight on 21st October, 1986, and it became necessary to reschedule the crew to operate PK-636 and series on 23rd October, 1986. Captain Raza Zaidi a Route Check Captain was scheduled to operate the Flight as Pilot-in-Command with First Officer Manzar Masood as Co-pilot under route check, and First Officer Rehan Ahmed

as third pilot. It was normal procedure to schedule a third pilot when a Co-pilot was undergoing a route check. First Officer Manzar had been informed that same morning, when he visited the Flight Operations Office, that he had been rostered for the PK-636 and series of flights, and that he would be undergoing his final route check on this flight. Since he had completed his allotted under supervision flying.

- 4.2. On the evening of the 23rd October, 1986 First Officer Rehan Ahmed was picked up for the flight, and it was at this time that he came to know that First Officer Manzar Masood was also to be picked up. On picking up First Officer Manzar, First Officer Rehan Ahmed learnt that First Officer Manzar had been scheduled for the same series of flights and was to undergo his final route check. On arrival at the Flight Operations, First Officer Rehan came to know that Captain Raza Zaidi was the Pilot-in-Command scheduled for the flights.
- 4.3. First Officer Rehan Ahmed asked Captain Raza Zaidi what his duties would be, and was informed by the Captain that since First Officer Manzar was to be route checked, he would not be able to give him (Rehan) any flying. The Captain told First Officer Rehan that he could either remain in the cockpit or in the cabin as he desired. First Officer Rehan elected to remain in the cockpit and observe.
- 4.4. The first flight, PK-636, to Peshawar was operated without incident. A VOR let down at Peshawar was not carried out on this flight because of C-130 traffic. The descent, approach, and landing were normal. After

turn round at Peshawar, the crew again boarded the aircraft and operated. Flight No. PK-673 from Peshawar to Lahore. On reaching overhead Lahore, First Officer Manzar carried out the let down, approach and landing. The Captain had to constantly check him on procedure since he made many mistakes. The landing was normal.

- 4.5. After normal turn round at Lahore, the aircraft F-27 Registration AP-AUX took off on scheduled domestic flight PK-672 at 1907 hrs P.S.T. On this flight as in the earlier flights Captain Zaidi occupied the left control seat, with First Officer Manzar flying the aircraft from the right control seat, and First Officer Rehan standing in the cockpit behind the two pilots operating the aircraft. There were a total of 54 souls on board the aircraft on this flight. Besides the 3 cockpit crew and two cabin staff there were 39 adult passengers, 5 Children and 5 infants occupying the 44 economy class seats with which the cabin was configured. Out of the 35 adult passengers two were Air Guards.
- 4.6. As in the case of the earlier two flights, First Officer Manzar the Co-pilot under route check was flying the aircraft with Captain Zaidi the Pilot-in-Command and Route Check Captain monitoring the flight and performing the functions of the Co-pilot, since he was not flying. First Officer Rehan the additional Co-pilot standing to the rear of the Captain and Co-pilot flying, observed. The flight from Lahore to overhead Peshawar was uneventful, and the Captain, who was handling the communications, reported over the Peshawar V.O.R at 9,500 feet at 2030 hrs P.S.T and a V.O.R. holding and let down procedure was commenced. (See Appendix "B").
- 4.7. During the let down, at 2040 hrs P.S.T when the aircraft

/was heading

was heading inbound 240 degrees, descending from 5,500 feet to 3,500 feet (height above airfield level was between 4,320 feet and 2,320 feet) the Captain reported his position 8 DME from the V.O.R and informed ATC that there was a lot of firing from the ground about two miles to his left with tracers reaching almost to his height. The Captain made this report after the firing had been brought to his attention by First Officer Rehan. When the ATC advised the aircraft to turn right to join for an approach for landing on Runway 17, the Captain informed ATC that the firing was not effecting him and he had made the report for information. The Captain further informed ATC that he would continue his let down for an approach to runway 35, and at this time informed the ATC that he had switched off all his external lights.

- 4.8. The Captain at this stage discussed the firing with the Co-pilot, and told him that earlier there used to be a lot of firing on the approach to runway 35, but that it had decreased lately.
- 4.9. Meanwhile the V.O.R let down procedure was continued, with normal heights being achieved, and normal check list procedures accomplished. During the final turn to the inbound heading, the landing gear was lowered, the flaps having been selected to $16\frac{1}{2}$ degrees down and checked prior to reaching 3,000 feet and before commencing the inbound turn. Landing gear was selected down at 2048"20" hrs. The rate of turn to inbound was too high, and as a result the aircraft was positioned well to the right of radial 177. The Captain monitored the height down to minima (Minima is 400 feet above airfield level) whilst instructing First Officer Manzar to turn to the left since the radial was way to the left. At 20 hrs 49 minutes and 02.5 seconds

the Captain told Manzar "Still right of the radial. Radial active". 15.5 seconds later the Captain transmitted to ATC "On finals. We have our lights off Sir". Between this transmission and the reply by ATC, the Co-pilot said, "Final landing checks and the Captain responded "O Kay completed". The ATC at 20 hrs 49 minutes and 25.5 seconds replied to the Captain's transmission "Roger. Switch on lights now. Clear to land 35". The Captain responded at 20 hrs 49 minutes and 27.2 seconds "Roger. Clear land". Immediately thereafter at 20 hrs 49 minutes and 28.5 seconds, the Captain said to the Co-pilot in Urdu "Buddy, Kia Kur Raha Hai Marviga Na". The Captain said these words in a normal tone with no signs of urgency/panic in his voice. At 20 hrs 49 minutes and 31.5 seconds the aircraft impacted the ground at 120-125 knots. The CVR tape ended at this time. (see Appendix "E₂").

- 4.10. From the time when the Captain reported to ATC at 20 hrs 39 minutes and 39.8 seconds about the firing, all transmissions from the aircraft were normal, with no further reports of firing, or of emergency or other difficulties, till the last transmission from the aircraft "Roger. Clear land" made at 20 hrs 49 minutes and 27.2 seconds P.S.T. just 4.3 seconds before first impact.
- 4.11. The aircraft first impacted the ground on the far edge of a 80 feet wide and 25 feet deep nullah, which it had just crossed. At the moment of impact the configuration of the aircraft was landing gears down and locked, and flaps down 16½ degrees. The aircraft was assessed to be in a 8 to 10 degrees nose up attitude, with a bank to the right of 5 to 10 degrees at the time of first impact. In this attitude the port wing, extended port main landing gear and the port engine and propeller

were clear of the edge of the nullah. The starboard main landing gear wheels impacted broken ground a few feet below the edge of the nullah, and were the first parts of the aircraft to contact the ground. The starboard landing gear outer wheel rim failed at this time, and pieces of metal of the failed rim and some shims from the starboard main landing gear were located just below the edge of the nullah. Part of the failed rim was found along with part of a maxaret unit at a point 132 feet ahead of the first impact point, along the wreckage trail (See Appendix "G"). At the time of first impact the starboard main landing gear failed and the starboard main landing gear shock strut broke away. During this failure of the main landing gear strut along with its down lock mechanism, some part of the failed strut caused the tail cone fairing of the starboard engine nacelle to tear free. This tail cone fairing was found lying ahead and to the left of the initial impact point. The engine, propellers and nacelle of the starboard engine cleared the edge of the nullah without striking the ground, nor did the starboard wing strike the ground. Immediately after the impact of starboard main landing gear with the ground, the bottom of the fuselage at a point just ahead of the rear entrance door impacted the edge of the nullah. The toilet drain mast was found 20 feet ahead of this point. This impact caused severe damage to the fuselage just ahead of the empennage resulting in the empennage being almost severed from the fuselage, but remaining attached to the fuselage by control cables, electrical cables, some fuselage skin and some fuselage longerons. From this point the empennage was aerodynamically ineffective in balancing the aerodynamic forces acting on the aircraft.

- 4.12. Probably at this stage of the accident sequence no injuries were sustained by the occupants of the aircraft, except possibly the Air Hostess who was at the rear of the cabin in her assigned position for landing.
- 4.13. After the initial impact described, above, the aircraft bounced into the air at about 120 to 125 knots, shedding parts of the toilet and airconditioning ducts which had been broken as the result of the initial impact. The empennage being ineffective and just hanging from the fuselage by the control cables, electrical cables, and some skin and airframe longerons, the fuselage at flying speed with wings attached, without the designed down force of the tail planes to balance the normal down moment of the nose, resulted in the nose pitching down sharply, and then aircraft impacting the ground nose first some 300 feet beyond the initial impact point. This severe impact broke the nose landing gear, crushing the forward portion of the aircraft. Almost simultaneously the propellers contacted the ground as the aircraft began to nose over onto its back. The propellers and their hubs broke away from the engines at the reduction gears. The cockpit area from the nose to just forward of the second row of seats was crushed as the aircraft nosed over, and the engines were crushed and bent downwards as was the leading edge towards the tip of the port wing. From first impact, second impact and nose over upto the time the aircraft wreckage came to rest inverted, some occupants including the Air Hostess, Flight Steward, three infants, and First Officer Rehan Ahmed were thrown out of the wreckage. The inverted wreckage skidded tail first coming to rest about 300 feet beyond the point of second impact (See Appendices "F" and "G"). It was during the second impact,

nose over, and subsequently, as passenger removed their lap belts that some injuries were probably sustained by some of the occupants. All lights were off, it was totally dark, and the passengers still in their seats were held by their lap belts in an inverted position. No fire occurred.

4.14. The first persons to arrive at the scene of the accident were some Afghan refugees from a nearby refugee camp. A police party arrived shortly thereafter, and these persons assisted by persons from the nearby village evacuated the injured and other survivors despatching them to hospitals in Peshawar in available vehicles.

4.15. Immediately after losing radio contact with the aircraft, the Duty Controller in the ATC informed Officer Commanding Flying Wing, PAF Base Peshawar, the Base Commander, Peshawar Base, the Zonal Manager C.A.A., and the Airport Manager C.A.A. of Peshawar International Airport. All these persons reached the ATC shortly thereafter, the Officer Commanding Flying Wing being the first to arrive. Since the helicopter belonging to the PAF was not adequately instrumented for night search operations it was not launched. Also since it was a dark night, the terrain along the extended center line was broken and rough, and the uncertainty of the wreckage location, a ground search party was not considered to be feasible. The normal action in accordance with the Disaster Plan of PAF Base Peshawar was activated and all agencies both Civil and Military were informed that the aircraft was missing, and requested to inform ATC Peshawar if it was located. The Airport rescue party remained on standby awaiting information from any source about the location of the aircraft. At 2240 hrs, almost two hours after the accident

occurred, the location of the wreckage was reported to the ATC, and the rescue party left immediately for the scene. The rescue party reached the scene at about 2300 hrs PST. The officials of the Civil administration arrived at the scene at about the same time. The wreckage was lying on barren ground near a graveyard at a point 2.5 nautical miles from the threshold of runway 35 on a track of 182 degrees. When the PAF and Civil Aviation Authority party arrived at the scene of accident, they found the Pilot-in-Command Captain Raza Zaidi and the Co-pilot First Officer Manzar Masood trapped in the extensively crushed cockpit. These two persons had not been removed earlier by the persons who first reached the scene of the accident, because of electric sparking in the cockpit area when attempts were made to remove them, and for fear of a fire starting. After PIA Engineers who had accompanied the rescue team had taken action to stop the sparking, the Pilot-in-Command, Captain Raza Zaidi and First Officer Manzar Masood were removed from the severely damaged cockpit. Both these persons were found to be dead when examined by the PAF Flight Surgeon. Evidence, later recorded during the investigation indicates that Captain Raza Zaidi was alive for some time after the accident.

- 4.16. The third pilot of the cockpit crew, First Officer Rehan Ahmed sustained serious injuries during the accident. At the time the aircraft initially impacted the ground, First Officer Rehan was in the process of returning to his position in the cockpit having gone to the galley for a glass of water and a damp towel. He had been thrown out of the aircraft and was lying near the left wing and was opposite the crushed cockpit near the damaged left engine.

- 4.17. As a result of the accident 13 occupants sustained fatal injuries, and 28 occupants sustained injuries of various degrees. Amongst the fatally injured persons were the Captain, the Co-pilot at the controls, the Flight Steward, the Air Hostess and two Air Guards who are members of the ASF (List of persons fatally injured and those surviving with injuries is at Appendix "C").
- 4.18. No third party person was injured as a result of the accident and no damage to property on the ground was incurred. The aircraft Fokker F-27 AP-AUX alongwith its engines and propellers sustained major damage and the aircraft as a whole was assessed as being beyond repair (Destroyed).

5. INJURY TO PERSONS

- 5.1. As a result of the accident, of the 54 souls on board the aircraft at the time of the accident, 13 suffered fatal injuries, these included the Captain, the Co-pilot flying, the Flight Steward, the Air Hostess and two Air Guards. Of the other 7 persons who sustained fatal injuries, 4 were adult passengers and 3 were infants. (See Appendix "C").
- 5.2. A total of 28 persons sustained injuries ranging from abrasions and lacerations, to head injuries and fractures. One of these injured persons was First Officer Rehan Ahmed the additional Co-pilot who was hospitalised. Of the remaining 27 persons, who were passengers, and who had sustained injuries, 7 were sent home after treatment, and 20 were hospitalised (See Appendix "D" for details of injuries to survivors).

See Appendix "C" for list of persons fatally injured and surviving with injuries). Thirteen (13) passengers survived the accident without injury. (See Appendix "H" for passenger seat positions and names of passengers). Note that of the four passengers in row "L" which was crushed, three sustained fatal injuries and one was seriously injured.

- 5.3. No persons other than occupants of the aircraft sustained injuries as a result of the accident.

6. DAMAGE TO AIRCRAFT

- 6.1. Fokker F-27 aircraft registration AP-AUX, alongwith its engines sustained substantial damage as a result of the accident, and has been assessed as totally destroyed. (See Appendix "L" for photographs of the wreckage and see also Appendix "F").

7. OTHER DAMAGE

- 7.1. No damage was caused to property on the ground as a result of the accident.

8. METEOROLOGICAL CONDITIONS

- 8.1. Weather at the time of accident was wind calm, smoke haze, and visibility 5 Kilometers. The moon had not yet risen. Cloud was 1 OKta Strato Cumulus at 4000 ft. (See Crash Observation at 2055 hrs PST and weahter report for 2000 hrs PST (Appendices "J₁" and "J₂"). Weather was not a factor in this accident.

9. AIDS TO NAVIGATION

- 9.1. The V.O.R was functioning normally and was serviceable. The aircraft was executing a V.O.R let down for an approach to runway 35 at Peshawar International Airport.

10. COMMUNICATIONS

- 10.1. Radio Communications between the aircraft and Peshawar ATC were normal. Communication was normal till a few seconds prior to impact, and no emergencies were reported. (See the transcripts of the ATC tape and the C.V.R tape at Appendices "E₁" and "E₂").

11. AERODROME AND GROUND FACILITIES

- 11.1. Peshawar Airport is a PAF, CAA Joint user airfield. The elevation is 1180 feet AMSL. Fire protection is category-VII. The runway direction is 353 degrees and 173 degrees and is designated 35 and 17 respectively. The runway and stopways have a bitumen surface; the length of the runway is 2743 meters and is 46 meters wide. The runway strength is LCN 70. Runway 35 has high intensity approach lights, and both Runway 35 and 17 have high intensity runway edge lights and threshold lights. Aids to navigation are a V.O.R with DME. All facilities were serviceable and available at the time of the accident. Peshawar Airport also has VASI and PAPI.

12. FLIGHT RECORDERS

- 12.1. The following Flight Recorder equipment was installed in Fokker F-27 aircraft Reg.Mk.AP-AUX at the time of the accident:-

12.1.1. **UNITED CONTROL CORP.** Flight Data Recorder
Model FA-542 Serial No.2436 with Magazine
S.No.5373.

12.1.2. **SUNDSTRAND DATA CONTROL** Cockpit Voice
Recorder Model V-557 Serial No.2400,
Manufacturers reference No.012.

12.2. The read out from the Flight Data Recorder was first accomplished at the PIA facility at Karachi. The foil was then hand carried to the National Transport Safety Board Washington D.C., where a read out was accomplished on 13th November, 1986 by the Specialist in the Recorder Laboratory. This read out was found to be much more accurate and has been used in this investigation, after a correction for +7 millibars pressure had been applied to the heights. This +7 millibars difference resulted from an incorrect pressure of 1020 mb, being provided by the person who hand carried the foil to Washington, against the correct barometric pressure of 1013 mbs. (The flight path plotted from the read out figures is placed at Appendix "K").

12.3. The magazine of the Cockpit Voice Recorder was also hand carried to Washington D.C, where a copy of the tape was prepared in the N.T.S.B. Laboratory. This copy was then used to prepare a cassette tape using filtering to provide the clearest possible recording. Using equipment provided by the N.T.S.B., Captain Shaukat, Chief Flight Inspector C.A.A. who had hand carried the tape to Washington D.C. U.S.A. attempted to prepare a transcript but since he was only available for a period of two days before he returned he was unable to prepare a satisfactory transcript. It,

/therefore,

therefore, became necessary for the members of the investigation to prepare a read out. This was accomplished over a period of 25 working days, using the equipment of the Shalimar Recording Company, which was kindly made available to the investigators in the Company Studio at Karachi alongwith assistance of the Company technician. The final transcript which is the best possible under the circumstances has been used for purposes of the Investigation. (see Appendix "E₂"). The transcript covers the complete tape and extends for a period of 35 minutes.

13. WRECKAGE

- 13.1. The wreckage of Pakistan International Airlines Fokker F-27 Reg.MK.AP-AUX was located at a place 2.5 nautical miles short of the threshold of runway 35 on a radial of 182 degrees from Peshawar V.O.R.
- 13.2. The aircraft first impacted the ground at 120 to 125 Knots on the far edge of a nullah, 80 feet wide and 25 feet deep, which it had just crossed. Marks and pieces of the aircraft at and upto the place where the aircraft impacted the ground the second time indicated that the aircraft was in a 8 to 10 degrees, nose high attitude with a bank to the right of 5 to 10 degrees, with the landing gear down, and flaps down 16½ degrees. The first part of the aircraft to strike the ground was the right main gear wheels, followed by the rear under fuselage just ahead of the rear entrance door.
- 13.3. After first impact the aircraft covered about 100 yards in the air and at this time second impact occurred. The

/aircraft

aircraft impacted the ground, which was generally level, nose first and then toppled over onto its back, and after skidding on its back came-to a stop some 200 yards from the first impact point.

13.4. The major portion of the aircraft wreckage, consisting of the fuselage, crushed cockpit, empennage and wings with the engines minus their propellers and gear boxes in a severely damaged condition still attached to the wings, came to rest about 200 yards from the initial impact. The fuselage with wings attached came to rest inverted. The cockpit and the fuselage upto the second row of seats in the cabin had been severely crushed as the result of the second impact and nosing over of the aircraft. The complete empennage from a point just aft of the rear entrance door had almost severed from the fuselage and remained attached to the fuselage by control and electrical cables and some airframe skin and longerons. The empennage had twisted through 180 degrees and was lying with the fin up. The left tail plane and elevator had sustained damage at the time of second impact and nosing over of the aircraft. Damage to the fuselage just ahead of the empennage had occurred at the time of initial impact. The only portion of the aircraft beyond the main wreckage was the starboard main landing gear oleo with the inboard wheel and tyre still in place and the outboard wheel hub with part of the rim and the tyre missing. This part lay 160 feet beyond and 100 feet to the right of the main wreckage.

13.5. No fire had occurred on any part of the wreckage. The fuel tanks had retained their integrity and there had been no severe leak at the time of the accident. However, when the aircraft came to rest with the fuselage and wings inverted, fuel leaked out via

/the vents.

the vents. After the wreckage had been cleared by the Investigators on 31st October, 1986, fuel was drained from the wing tanks. 73 gallons were drained from the left tank and 17 gallons from the right tank. (See Wreckage Diagram Appendix "G" and photographs Appendix "L").

14. FIRE

14.1 No fire occurred during or after the accident.

15. SURVIVAL ASPECTS

15.1. The initial impact was such that no injuries should have been sustained by passengers and crew who had their seat belts fastened, except perhaps for the stewardess, whose seat was in an area which was damaged at the time of this impact, and had been thrown out of the aircraft at some stage prior to second impact. The second impact was more severe, but witness the number of persons who survived with and without injuries, the second impact was also survivable. Most of the persons who sustained fatal injuries were either in area which were crushed during the second impact and the nose over of the aircraft or persons who were not restrained by seat belts, namely three infants and possibly one or two passengers, whose seat belts may not have been fastened. The Captain and Co-pilot flying, the Flight Steward, the Air Hostess and two Air Guards were in areas which sustained impact or crushing damage. Survival of the additional Co-pilot F/O Rehan Ahmed is miraculous in view of the fact that he was not restrained, and was standing in an area that sustained

both impact and crushing damage. Six seats in the cabin broke free from their attachments to the floor and of the occupants only one sustained fatal injuries.

15.2. Organised rescue teams from the Airport reached the scene about two hours after the accident occurred. At this time local people and a police party who reached the scene had already despatched the injured survivors to hospitals in Peshawar. Only the Captain and Co-pilot were still trapped in the wreckage and were removed dead from their positions, when the officials from the Airport arrived at the scene. The rescuers who arrived shortly after the accident occurred had been unable to extricate these two persons, because of sparking taking place whenever they attempted to do so. Evidence indicates that the Captain was alive for quite some time after the accident. It is opinion, therefore, that had immediate rescue by qualified personnel been possible, the possibility existed that some additional lives may have been saved. The failure of rescue parties from the Airport to reach the scene earlier is discussed in detail later in this report under the heading "DISCUSSION".

16. TEST & RESEARCH

16.1. A complete study was made of the landing gear system to analyse the evidence found at the scene in relation to the position of the landing gear. See para 18, sub sub para 18.8 & 10.

17. OBSERVATIONS

17.1. It was noted that no specific duties are laid down for pilots performing third Pilot duties as in the case of F/O Rehan Ahmed. These require to be laid down.

- 17.2. It has been observed that at a time when the aircraft was descending just a few minutes before it was to land that First Officer Rehan Ahmed went back to the galley for a glass of water and damp towel to freshen up for landing. From his statement it would appear that this is a normal practice. Such action whilst on the approach is considered to be a hazard to personal safety since at this stage all persons on board the aircraft should be wearing their safety belts. If indeed this is a normal practice, then the operations management should take steps immediately to ensure that specified instructions/requirements are being met and all persons are strapped in for all take offs and landings.
- 17.3. It has been observed that First Officer Rehan Ahmed did not use the jump seat and stood behind the Captain and Co-pilot seats during the flight. The requirement for all occupants of the aircraft to use restraining belts for take off and landing needs to be enforced in future.
- 17.4. It was observed that the Civil Aviation Authority has a "Disaster Plan" to be followed in the event of accidents or emergencies at Peshawar Airport, and the Pakistan Air Force authorities at PAF Base Peshawar also have a Pre-Accident Plan for Peshawar Base. Peshawar airfield is a joint user airfield and in the accident the PAF would react in accordance with their Plan. There is a need, therefore, that the C.A.A. Airport Managers at joint user airfields, co-ordinate with the PAF Authorities concerning the Plans so that one common plan is used and command and control in various situations is specified, and all concerned agencies work with the common aim of saving lives and property. HQ CAA should take up the matter with

PAF Air Headquarters to ensure proper co-ordination to prepare joint plans at joint user airfields.

18. INVESTIGATION

18.1. On 23rd October, 1986 at 2050 hrs PST Pakistan International Airlines aircraft Fokker F-27 AP-AUX operating scheduled domestic flight PK-672 from Lahore to Peshawar met with an accident whilst the aircraft was on the final approach to Runway 35 at Peshawar International Airport. There were a total of 54 souls on board the aircraft including the crew and five infants. As a result of the accident 13 persons including three infants sustained fatal injuries, 28 persons sustained injuries of varying degrees and 13 persons, survived with no injury except for minor abrasions. Of the 28 persons sent to hospital, 7 were released after treatment and 21 persons were hospitalised (See Appendices "C" "D" and "H").

18.2. Investigators were immediately appointed (Appendix "A"). The Investigator-in-Charge arrived at Peshawar from Karachi at 1100 hrs PST on 24th October, 1986 by the first available PIA flight, and proceeded to the scene of the accident by PAF helicopter alongwith the Managing Director PIA, who had arrived at Peshawar by the same flight. This gave the Investigator-in-Charge an opportunity to view the scene from the air and orientate the scene of accident with the Runway 35 threshold of Peshawar Airport.

18.3. Other members of the Investigation Team arrived at the scene by road. The investigation commenced immediately. Mr. Taj Mohammad Senior Airworthiness Surveyor had reached the scene of the accident at 0700 hrs on 24th October, 1986. He had already prepared a rough wreckage plot and with his

assistance the scene of the accident was examined. (See Appendix "G" for Wreckage Diagram).

- 18.4. From an initial survey of the scene of accident, the ground marks, and the wreckage, it became apparent that the complete aircraft with engines running, flaps down $16\frac{1}{2}$ degrees and landing gear down had initially impacted the ground with the starboard main wheels at a point a few feet below the edge of a deep nullah which was 80 feet wide and about 20 feet deep. This initial impact of the starboard main wheels resulted in failure of the rim of the outboard main wheel, and failure of the starboard main landing gear shock strut which separated from the aircraft causing the starboard engine nacelle tail cone and the venturi drain of the nacelle to break off. The starboard engine, propeller and nacelle did not strike the ground at this stage. Immediately after the starboard main wheel struck the ground and broke off, the under surface of the fuselage just ahead of the rear fuselage passenger entrance door struck the edge of the nullah. This impact of the fuselage caused serious damage to the fuselage just ahead of the empennage remained attached to the fuselage by cables and some fuselage longerons at the top of the fuselage. In this condition, the empennage became aerodynamically ineffective as a control or balancing surface. The toilet drain mast was located on ground just ahead of the fuselage impact point. The port wing, engine and propellers, and the port main landing gear did not strike the ground. From this evidence at the initial impact point it was deduced that, at the time of the initial impact, the aircraft was descending, in a nose high attitude assessed to be 8 to 10 degrees with a 5 to 10 degrees bank to the right, with the landing gear down and flaps down $16\frac{1}{2}$ degrees. The

engine were operating at a power consistent with an approach for landing.

- 18.5. Evidence from the scene of the accident further indicated that the aircraft after initial impact bounced into the air with flying speed. The damaged empennage was at this time ineffective aerodynamically as a control or balancing surface, and, as a result of the normal down force on the tail of the aircraft pitched down sharply and impacted the surface of the ground, which was generally level, at a point about 315 feet ahead of the initial impact point. This impact was heavy, with slight bank to the right, and nose first. During its short flight through the air parts of the toilet and airconditioning ducts at the rear of the aircraft fell out of the aircraft, and it is probable that the Air Hostess and her seat fell out of the aircraft at this stage. On second impact, the aircraft nosed over and fell onto its back, during which time some occupants were thrown out of the aircraft. These included three infants, the Flight Steward, and First Officer Rehan Ahmed the Co-pilot not flying. The main wreckage, with the cockpit crushed and fuselage crushed to the second row of passenger seats skidded on its back, tail first, and came to rest about 300 feet beyond the second impact point. No fire occurred. The damage starboard main wheels and strut after breaking off the aircraft at initial impact flew through the air in the direction of flight. The main strut and gear down lock strut were found, about 450 feet and 315 feet respectively, beyond the initial impact point, and the oleo with the main assembly of the starboard wheel, consisting of the inboard wheel, hub and tyre, and the remaining parts of the outboard wheel and hub minus the tyre, was found at a point 160 feet beyond the tail of the

aircraft main wreckage, about 100 feet to the right of the wreckage trail:center line a measured distance of 260 feet from the tail of the aircraft which was still attached by cables to the main fuselage (See Appendix "G"). Note the parts of the wreckage have a linear scatter.

18.6. **Scene of Accidents.** As described earlier the aircraft had first impacted the ground at the edge of a 80 feet wide and 20 feet deep nullah, bounced into the air for 300 feet, toppled over and skidded on its back, coming to rest with the tail of the aircraft about 600 feet from the initial impact point just short of an irrigation channel and a row of trees growing on the far side of the channel. The ground was barren, fairly even, near a grave yard. The location of the accident scene was $\frac{1}{2}$ to 1 kilometer from village Sheikh Mohammadi towards Peshawar Airport. The main wreckage was lying in a straight line a little to the left of the extended centre line of the runway, and was 2.5 nautical miles short of the runway threshold on a bearing of 182 degrees from the Peshawar V.O.R.

18.7. **Ground Marks.** Examination of ground marks at the scene of the accident indicated that the aircraft first impacted the ground with the starboard main wheels a little below the edge of a nullah which it had just crossed. Check back along the approach path of the aircraft did not reveal any signs of impact earlier than this impact. This impact of the wheels caused the wheel assembly and the main landing gear strut alongwith the lock strut to break away from the aircraft, and the hub rim of the starboard outer wheel to break. The next part of the aircraft to strike the ground was the bottom surface of the fuselage, and it was established from subsequent examination of the wreckage that the bottom of the

fuselage just aft of the rear passenger entry and exit door had struck the ground at the edge of the nullah. The absence of ground marks of the port main landing gear, engine and propeller, and absence of ground marks of the starboard propeller and engine nacelle, and also no marks to indicate that the wings had struck the ground at this stage, led to a conclusion that at the time of initial impact the aircraft was nose up about 8-10 degrees banked to the right about 5-10 degrees. The next ground mark that was significant was a heavy impact mark made by the fuselage when it contacted the ground in a steep nose down attitude 315 feet beyond the initial impact point. Further ground marks at this point indicated that the second impact occurred with the right wing slightly lower than the left wing. The propeller slash marks indicated that both engines were developing power at the time of this second impact, and that the aircraft nosed over onto its back shortly thereafter and skidded on its back till the main wreckage came to rest about 300 feet beyond the second impact point. Ground marks indicated that the left wing towards the tip contacted the ground as the aircraft was nosing over onto its back. Damage to the aircraft confirmed the reading of the ground marks and led to a conclusion that after first impact the aircraft bounced into the air still with flying speed, and because the empennage was no longer generating an aerodynamic force to balance the normal down moment of the nose, the nose pitched down sharply and the aircraft impacted the ground nose first in a steep nose down attitude and nosed over onto its back. Between the first and second impact points, the marks noted on the ground were confirmed as having been made by parts of the toilet and airconditioning ducts which fell out of the

aircraft because of damage caused to the airframe and these parts at the time of first impact of the fuselage. No signs of the port main gear striking the ground were found anywhere along the wreckage trail. (See Appendix "G") for Wreckage Trail).

18.8. Wreckage. The following information was obtained from an examination of the wreckage at the scene of the accident, and subsequent strip examination of parts at the PIA Maintenance Facility at Karachi.

18.8.1. The wreckage of Pakistan International Airlines Fokker F-27 aircraft identified by its Registration Marking AP-AUX was located at a point 2.5 nautical miles from the threshold of Runway 35 Peshawar International Airport on a bearing of 182 degrees from the runway threshold of Runway 35.

18.8.2. No evidence of in-flight or post-flight fire was found on any part of the aircraft. Some signs of electrical arcing were evident in the cockpit area near the point from which the body of Captain Raza Zaidi was recovered. This arcing was observed by the investigators also during examination of the cockpit area, and was caused by cables from the batteries which had broken and were touching the parts of the airframe. This sparking had been stopped during rescue operations to remove the flight crew, by inserting the branch of a tree between the cable and the airframe part where sparking was occurring. Removal of both batteries stopped the sparking, and allowed the investigators to proceed with examination of the cockpit area.

18.8.3. In view of the report in flight by the pilot about firing from the ground, special attention was given to examination of the wreckage to determine if the aircraft had been hit by a bullet. It was determined from the Pakistan Air Force authorities at Peshawar that they had experience where some fighter aircraft had sustained bullet damage during flight. They also showed the investigator spent bullets retrieved in one day from the airfield, tarmac, runways, and taxiways. These were in total 1½ to 2 kilograms of spent bullets of various calibers, ranging from S.G and L.G shot gun pellets, .22 bore rim fire bullets, .25 and .32 revolver bullets, 7 mm, .303, 7.62 rifle bullets and included spent tracer bullets used in the Kalashnikov automatic weapon. The investigators during investigation at the scene of accident found one spent lead bullet of about .450 size used in a Matrini rifle and, one bullet of a 7 mm rifle. On examination it was obvious that these bullets had not struck anything other than the ground on their fall to earth, and that they had been lying at that position for some considerable time before the accident occurred. These were not relevant other than leading to a conclusion that if one looked carefully in the areas surrounding the airfield one would certainly find spent bullets. Examination of the wreckage revealed no evidence that the aircraft had been hit by ground fire during flight. The subject of firing from the ground is covered in some detail under the heading "Discussion" later in this report.

18.8.4. The fuselage with wings attached was found lying inverted. The empennage was still attached by control cables and electrical cables to the fuselage, and was at the rear of the airframe. The empennage was almost upright and the condition of the fin demonstrated the fact that the empennage was twisted through about 180 degrees when the aircraft nosed over onto its back. The damage evident on the left tail plane and elevator was indicative that this part struck the ground at some stage during the second impact, whilst the complete empennage was twisted to about 90 degrees in relation to its normal position on the fuselage. This condition of the empennage confirmed that serious damage had occurred ahead of the empennage during initial impact of the aircraft with the ground. It was noted that the fuselage lower surface skin had been torn rearward from station 12975 to station 17680. This damage was caused at the time of initial impact of the aircraft with the ground. Other than this area there was no evidence that the undersurface of the fuselage had contacted the ground. (See photographs at Appendix "L" and also See Appendix "F").

18.8.5. The propeller slash marks found at the second impact point indicated that both the engines were operating with power at the time of this occurrence. Examination of the propeller at the scene of accident and later strip examination of both engines and propellers confirmed that the engines were developing

power at the time of the second impact and that this power (assessed to be approximately 11000 R.P.M) is consistent with the power used for an approach to landing. (The sound of the engines recorded on the C.V.R confirms that the engines were operating upto the first impact with no change in engine sound). (See strip reports on No.1 and No.2 engines and No.1 and No.2 propellers Appendices "M₁" "M₂" "M₃" "M₄").

18.8.6. Both the Captain's and Co-pilot's altimeters were removed from the aircraft and tested. Tests were inconclusive due to damage sustained by these instruments during the accident (See Appendix "N"). Observations at the scene of accident were Captain's Altimeter indicating 1230 feet, pressure setting 1013 millibars, and the Co-pilots Altimeters indicating 1200 ft, pressure setting 1020 millibars. (The CVR recording confirms that both pilots set the correct pressure setting of 1013 millibars on their altimeters prior to joining overhead for a V.O.R descent for approach to runway 35 at Peshawar).

18.8.7. The flaps were found to be extended to the 16½ degree position. (See Photographs Appendix "L").

18.8.8. It was determined from an examination of all parts of the starboard main landing gear that the gear was extended and locked down at the time of initial impact with the ground. The damage was consistent with such a condition. The lock strut of this gear was found separate from the main landing gear strut and was found folded with no damage to the lock.

18.8.9. The nose gear main assembly and the nose gear up lock were found short of the main wreckage and ahead of the second impact mark. The nose gear had broken as the result of heavy impact forces at the time of second impact of the aircraft with the ground in a nose down attitude (See Appendix "L" for damage).

18.8.10. The left main landing gear doors on the No.1 engine nacelle were found to be almost closed. The complete left main landing gear assembly was found retracted inside the nacelle, with the down lock strut folded, and the uplocks open. There was no indication of impact damage to the left main landing gear assembly or its locks. This gear had obviously not impacted the ground during first impact or subsequently during the second impact and nose over. This raised a doubt as to the position of the landing gear at the time of impact. However, on obtaining the CVR ^{data} rear out it was obvious that the landing gear had not been raised by the Flight Crew prior to the first impact. This was confirmed by the damage to the starboard main landing gear, which was the first part of the aircraft to strike the ground. The damage sustained by this landing gear is consistent with damage that would occur with the landing gear down and locked. Failure of the starboard main gear strut resulted in a force being applied in the correct direction to unlock the up lock and thus permit the lock strut to fold. Failure of the starboard main strut and down lock strut caused a failure of the pneumatic pressure lines to the down lock piston of the main jack of the starboard

down

landing gear. This caused leakage of pneumatic pressure from the system, and during second impact is a steep nose down attitude, the pneumatic panel lines and the lines from pneumatic bottles were ruptured as the aircraft was nosing over and prior to its falling over onto its back. Since the attitude of impact was steep, the port landing gear in the down and locked condition did not strike the ground. As the aircraft fell onto its back, inertia forces acting on the now free from pressure main actuator, caused the piston to move towards the up direction thus unlocking the down lock and permitting the left main gear to fall into its nacelle. The foregoing is the one possible way the port main landing gear reached the position in which it was found. The estimated time between initial impact and second impact was just 1.25 seconds, which time would not be enough for retraction by the pilot. In addition, during this period there would have been a high negative "G" force acting on the aircraft because of the rapid nose down pitch, which would have made it impossible for the landing gear to be raised by the crew after first impact.

- 18.8.11. The Flight Data Recorder and Cockpit Voice Recorder were found close to the empennage, broken from their mountings. These recorders were in good condition and were taken into custody by the Investigators. Subsequently read outs from both recorders were accomplished. Further details are under the heading "Documents" in subsequent paragraphs.

18.8.12. Small pieces of metal were found just ahead of the initial impact point of the starboard wheel. This metal was identified as metal from the broken rim of the starboard landing gear outboard wheel hub. This indicates that the rim failed on initial impact and is suggestive of a high rate of descent at the time of impact. Some shims from the right main landing gear were also found at the same point. A piece of broken rim of the starboard gear out board wheel hub was located ahead and slightly to the right at a distance of 132 feet from the initial impact point of the wheel (See Appendix "G"). The main landing gear strut was found to the right of the center line of the wreckage trail at a point about 450 feet from the initial impact point. The tyre of the right out-board main wheel was lying in the wreckage trail some 550 feet from the initial impact point. The remainder of the broken hub, with the complete wheel including the tyre of the inboard main wheel still attached to the oleo portion of the starboard main landing gear had come to rest in a field at a point 100 feet to the right of tail portion (Empennage) and about 160 feet beyond the wreckage. This was the piece of wreckage which had travelled the furthest along the wreckage trail, and probably flew through the air from the initial impact point to the position in which it was found. (See Appendix "G").

18.8.13. The cockpit had been crushed and extremely distorted as a result of the second impact of the aircraft in a steep nose down attitude

and subsequent nosing over. For the foregoing reason the positions of switches and levers are not reliable evidence of their position at the time of initial impact. The following readings of instruments, position of levers and switches, and condition of light bulbs were noted:

1. Altimeter Left side Height: 1230 feet
2. Altimeter Right side Pressure
 Setting : 1031 mb
 Height : 1200 ft
 Pressure
 Setting : 1020 mb
3. Clock stopped at 1547Z (Local time
 2047 hrs PST)
4. Fuel flow meters Left : 850
 Right : 680
5. Booster pump Left : on red mark
 pressure Right : 10
6. H.P.Cocks Left : Shut
 Right : Shut
7. Power levers Left bent at idle
 position
 Right at idle position.
 (See App "0" for
 strip report on
 pedestal)
8. Elevator trim Quarter nose up
9. H.F.Communication settings:-
 - i) 316 KHZ switch in "OFF" position.
 - ii) Master Radio Switch "ON".
 - iii) Speaker selection to Captain's side.

iv) Public Address Switch to "HI".

v) Marker Beacon "OFF".

10. ADF No.1 switch to ADF position
Frequency selection 318.5 KHZ.
11. VHF Comm.No.1 switch to PWR
Frequency selection 125.5 MHZ.
12. NAV.No.1 selection to DME
Frequency selection 115.25 MHZ.
13. VHF COMM No.2 switch to "OFF" Frequency
selection 127.550 MHZ.
14. DME placarded "INOPERATIVE".
15. ADF NO.2 switch to ADF position
Frequency selection 308.0 KHZ.
16. ATC Transponder
ALT Mode "A"
Source (1) Switch to ALT RPTG.
17. Left control column wheel broken in
right position.
Right control column wheel free.
18. Both Turn and Bank indicator showing
turn to right.
19. Fuel Pressure Indicator
Left : 5 PSI
Right: 10 PSI
20. Captain's R.M.I reading 310 degrees
21. Co-pilot's R.M.I reading 352 degrees
Gyro Compass reading 354 degrees

22. Elevator Control Cables

One cable broken under tension	before
One cable pulled out at connector	partial
	bulk-
	head

23. Flaps down 16.5 degrees

24. Oil Pressure bulb

No.1 coil unstretched		Indicates that were not illu- minated at impact.
No.2 coil unstretched		

25. Fuel Panel:

Water Methanol Switches both "ON".
Left indicator bulb coil partially stretched
Right indicator bulb coil partially stretched.

26. Cockpit Dome light switch "OFF".

C.B. Panel light switch "ON".

27. Fuel tank isolating valve test switch
light bulb Coil unstretched.

28. Pilot heat switch "ON".

29. Booster Pumps

Starboard - both "ON"
Port - both "OFF"

30. Instrument lights control all full bright.

31. Wind shield de-icing selection "LOW".

32. Fuel Trim datum set to 70%.

33. Landing Lights - Extended.

34. Landing Lights Switches "OFF".

35. Gang Bar "OFF".

36. Battery Master Switch "EXT".

37. Inverters.

No.1 "OFF"

No.2 "ON"

EMER "OFF"

38. Propeller Lights:

Flight Safety unlock lights both
bulbs coils stretched.

Flight Fine unlock both bulbs coils
unstretched.

Prop below lock both bulbs coils
unstretched.

39. Propeller warning lights:

Flight Safety lights bulb coil
found fused.

Flight Fine lock unsafe light
broken/missing.

40. Generator Overheat lights:

No.1 bulb missing/cover broken.

No.2 bulb coil unstretched.

41. Landing lever bent in down position.

42. Cabin seats left hand side A to J still
attached to floor.

43. Cabin seats right hand side B,C,G,H and J
still attached to floor.

44. Category III emergency exits both sides
Open.

18.8.14. The complete control pedestal was brought to
Karachi where it was examined at the P.I.A.
Maintenance Facility. The position of control

levers are not necessarily the position of these levers at initial impact in view of the distortion that the cockpit was subjected to during second impact and subsequently. (Appendix "O").

18.8.15. A description of damage to F-27 Aircraft AP-AUX is at Appendix "P". (See also Appendices "G" and "L").

18.9. Documents. Documents relating to the aircraft, flight crew, weather, ATC, the Standard Operating Procedures, the flight, the airfield, and previous reports of firing from the ground at Peshawar and action taken by C.A.A were examined. The PAF Peshawar Accident Plan and the C.A.A Emergency Plan for Peshawar International Airport were also examined. Information obtained from documents are included in this report at paragraphs 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 16 and 17.

18.9.1. Read out of the ATC tape and preparation of a transcript was accomplished shortly after the investigation began. (See Appendix "E₁").

18.9.2. A transcript of the Cockpit Voice Recorder tape was prepared by the investigators, with assistance from the National Transport Safety Board, Washington D.C. U.S.A, and the Shalimar Recording Company. The final transcript confirms the ATC tape transcript, and has been of great use in the investigation. Preparation of the final tape transcript involved 25 working days by the investigators before an acceptable transcript was prepared and timings included. The main problem experienced in the read out of cockpit conversations was that the cockpit conversations had to be isolated from the other

noise, including engine noise since these conversations were recorded on the cockpit Area microphone channel which picked up all other sounds as well. Had boom microphones been used along with interphone selection, then this problem would not have existed and read out would have been easier, and time would have been saved. There is a need to consider making use of boom microphones for both radio transmissions and inter-cockpit conversations mandatory from take off to top of climb, and from top of descent to aircraft shut down. The Cockpit Voice Recorder tape in the case of this accident rules out flight crew incapacitation as being a cause or contributory cause for the accident. Additionally the C.V.R. tape confirms that the engines were running without change in their sound upto the first impact at which time the tape ended.

- 18.9.3. Read out of the Flight Data Recorder (See para 12.2) was accomplished. From F.D.R data the flight path was plotted. (See Appendix "K"). This pilot confirms that the turn onto final was accomplished at too high a rate of turn which resulted in the aircraft being well to the right of the inbound radial. This is also confirmed by the cockpit conversation recorded on the C.V.R at this time. It was noted from the F.D.R read out that the aircraft continued to descend through the Minimum Descent Altitude of 400 feet A.G.L at the same rate with no levelling off at M.D.A as required by procedures since the the call of "Runway in Sight" had not been made at this time. The last call concerning

the height was at minima, when the Captain said at 20 hrs 48 minutes 57.5 seconds "Radial is way to the left turn it to the left. Approaching minima. ^{اوی} FLAPS DOWN ^{کردیا} O.K. Minima!" This call was given 34 seconds prior to impact.

18.9.4. Both from the ATC tape and the Cockpit Voice Recorder Tape the following conversation was noted at 20 hrs 42 minutes and 35.8 seconds between the aircraft and the ATC.

Capt:: Peshawar PK-672.

Tower: Go ahead. Sir.

Capt : Presently we are 8 DME and there is a lot of firing going on on our left and tracers are coming up almost our height. Should be about couple of miles to our left now.

Tower: O'Kay Sir you can turn right and join left hand down wind Runway 17.

Capt : Negative. We are presently clear of tracers but that is for your information.

Tower: O'Kay Sir.

Capt : And we have all our external lights off.

Tower: Thanks.

It was noted that following the above report of firing from the ground, no report of firing or any other problem was transmitted to the ATC by the aircraft. Contact with the ATC was normal upto the last call by the aircraft "Roger Clear Land" in response to the ATC clearance to land 35. Taking into account the

reported position of the aircraft at the time of making the report of firing it is established that firing was at a place 13 nautical miles from the place the aircraft commenced the final turn for landing and was not effecting the final approach. Except for the fact that the Captain elected to continue his let down and approach for landing with all the aircraft external lights including the landing lights off, the firing that was reported in no way could be a cause of distraction to the Pilots flying, during the final let down and approach for landing, during which the accident occurred.

18.9.5. The following notes from the Flight Operations Manual of PIA are considered relevant to the investigation:

"Page 92 - Para 39 Training Policy.

"At the end of completion of all training and endorsement of type rating by the Department of Civil Aviation, formal clearance for independent operation will be given by the Director Flight Operations or his designated nominee".

Page 100-Para 20 Specification Co-pilots.

"F-27 Licence Category "CPL with Instrument Rating 250/300 hrs Flying Experience".

Page 120 - Para 45 "Take off/Landing Pilots"

- "(b) Supervisory Pilots may give take offs and landings to any Pilot holding proper type rating, regardless of experience.
- (c) The prerogative to take over control or not to give a take off or landing rests entirely on the Captain's judgement. The responsibility for all events on a flight rests with the Pilot-in-Command".

Page 121 - Para 49 "Policy Supervisory Pilots".

- "(a) Grant of supervisory assignment will remain the Prerogative of the Management to be exercised by Director Flight Operations at his Sole discretion."
- "(b) Supervisory Pilots will generally be divided into three Categories and the normal progression for appointment as Flight Instructor will be as follows:-
 - (i) Route Check Pilot.
 - (ii) Simulator Instructor
 - (iii) Flight Instructor

18.10. **Witnesses.** During the investigation, statements of 26 persons were recorded. A list of Witnesses is at Appendix "Q" and the statements of the witnesses are at Appendix "R₁" to "R₂₆". Witnesses comprised persons who observed or participated in the event, persons having Specialist knowledge about the crew or passengers, persons who participated in rescue operations, and persons having responsibility for management, operations(al) training and aircrew proficiency. Relevant points brought out by witnesses were as follows:-

- 18.10.1. The landing gear had been selected down prior to the accident, and the port landing gear was observed to be down. (Conformed by C.V.R tape).
- 18.10.2. The landing lights had not been switched, on prior to impact.
- 18.10.3. There was no change in engine sound prior to impact. Just prior to impact the aircraft was banked to the right.
- 18.10.4. On the first flight from Islamabad to Peshawar a holding pattern and let down were not carried

out because of C-130 traffic. Nothing unusual occurred during this flight (PK-636).

- 18.10.5. Just prior to impact neither the Flight Steward nor the Air Hostess were in the galley.
- 18.10.6. Moments before impact the Captain was heard saying "Manzar Yeh Kia Kur Raha^e Ho" or similar words. The C.V.R confirms that these words were "Buddy Kia Kur Raha Hai Murvaiga Na" said in a normal conversational tone. First Officer Rehan stated the words he heard were shouted.
- 18.10.7. All lights went off after impact. There was complete darkness in the cabin after the aircraft came to rest.
- 18.10.8. First Officer Manzar Masood was informed on the morning of 23rd October, 1986 that he was detailed for a route check.
- 18.10.9. F/O Rehan noted Manzar to be tense and quiet during the flight. After take off from Lahore Manzar was even tenser due to mistakes committed on the Peshawar to Lahore flight earlier.
- 18.10.10. During the let down at Peshawar F/O Rehan reported the firing to the Captain who then reported to ATC Peshawar.
- 18.10.11. After the final turn during the V.O.R let down at Peshawar, the aircraft was right of the runway. (This is confirmed from both the C.V.R and F.D.R. and outs).

- 18.10.12. When the aircraft was at an altitude of 2000 to 2100 feet the aircraft was still descending (Confirmed from F.D.R read out) Manzar was flying by reference to instruments, the Captain was looking outside and at the instruments. The Captain was relaxed. First Officer Rehan went back to the galley to get a cold towel at this time.
- 18.10.13. Witness No.7 an Air Force Pilot observed the let down made by First Officer Manzar at Lahore on the preceding flight from Peshawar to Lahore. He stated that First Officer Manzar was generally tense and under-confident. Witness was surprised that F/O Manzar was not familiar with the cockpit.
- 18.10.14. Witness No.7 stated that F/O Manzar made many mistakes during the let down at Lahore and the Captain was getting annoyed and constantly checking him on procedures.
- 18.10.15. The announcement to fasten seat belts had been made by the Air Hostess.
- 18.10.16. The aircraft banked right just before impact.
- 18.10.17. Witness No.3 a passenger stated that just before impact he heard someone say "Kia Kur Rahay ho Yar". The witness is not certain who said these words, however since the witness was seated in seat D-3 which is the ninth row from the front towards the rear of the aircraft it is not possible that he could have heard any conversation from the cockpit, even if shouted. The statement was recorded on 26th Oct., 1986, and prior to this a statement made by First Officer Rehan Ahmed that just prior to impact the Captain had

/shouted

shouted "Manzar Yeh Kia Kur Raha Ho", had been reported in the press. It is possible that the witness had read these reports and been influenced by them, or that some passenger near him had uttered these words.

- 18.10.18 About 10 minutes after the accident occurred people from a neighbouring Afghan Refugee Camp, about 5 to 7 of them came with lanterns and started rescue work.
- 18.10.19. At least two witnesses stated that the Afghans looted such things as watches, necklaces, rings and bangles from injured and dead persons.
- 18.10.20. The Captain was alive in the wreckage of the cockpit for some time. He could not be rescued because whenever attempts were made to extricate him there was severe sparking from that part of the wreckage.
- 18.10.21. On arrival of the rescue party from the Airport about two hours after the accident occurred the Captain and Co-pilot were still in the wreckage of the severely crushed cockpit area. Engineers of PIA accompanying the party using a branch of a tree stopped the sparking and the Captain and Co-pilot F/O Manzar Masood were removed from the wreckage. On examination by the PAF Flight Surgeon these two persons were found to be dead.

/18.10.22.

- 18.10.22. The aircraft PK-672 had not landed after last contact on the final approach. (This was the information given to Wg.Cdr.(Bilal Khan Witness No.12).
- 18.10.23. The PAF radar informed Witness No.12 that the aircraft had disappeared from the scope at a distance of 14 miles South East of Peshawar. (The radar trace when examined showed that radar had the aircraft on the scope when it had turned inbound for the final approach).
- 18.10.24. The runway and approach within the airfield boundary were inspected by the crew of the crash tender on orders of Wg.Cdr. Bilal witness No.12.
- 18.10.25. With no visual or radio contact with the aircraft, and taking into account the radar report received by Witness No.12, it was visualised that the aircraft may have headed out of Peshawar. The witness activated the action plan for Hi-Jacking/ Aircraft overdue.
- 18.10.26. At 2235 hrs Witness No.12 was informed by Wg.Cdr.Maqsood, A.D.A.I., that the wreckage had been sighted close to Sheikh Muhammadi village. The rescue party left for the scene immediately.
- 18.10.27. Witness No.14 the Airport Manager, C.A.A went to the Lady Reading Hospital after returning from the scene of the accident. It was in the early hours of the morning before 0500 hrs on 24th October, 1986. He was informed that

the D.C Peshawar, had waived the requirement for autopsy of the bodies. (The D.C. Peshawar had confirmed in his statement that he had given clearance for the release of dead bodies without autopsy).

- 18.10.28. Witness No.26 Chief Pilot F-27 stated that during training First Officer Manzar Masood was a weak case. His weakness was in instrument seanning, however he followed procedures with effort.
- 18.10.29. F/O Manzar successfully qualified his P-2 rating check, his performance was satisfactory.
- 18.10.30. Witness No.26 who had flown earlier with Captain Raza Zaidi, considered him to be a competent pilot.
- 18.10.31. Witness No.26 stated that with his single engine background on small aircraft First Officer Manzar, made a quantum jump converting to the F-27. Most of the training on the F-27 was accomplished at night because of availability of aircraft at that time.
- 18.10.32. Witness No.26 stated that a Captain should take over controls if safety of flight is jeopardised.
- 18.10.33. A route check Captain is not a flight instructor and is not qualified to impart inflight instructions. A pilot under check is to be briefed by a route check Captain about errors and deviations after the flight.
- 18.10.34. Witness No.26 defined the functions of Route Check Captains as:-

- (a) Checks Captains and Co-pilots for proficiency, licence renewal, and in the case of Co-pilots for renewal of instrument ratings.
- (b) Checks Captains and Co-pilots for the initial issue of type ratings.
- (c) Conducts under Supervision Flying of Captains and Co-pilots.
- (d) Conducts Route Checks of Captains and Co-pilots. During these Route Checks the Route Check Captains observe proficiency of pilots, aircraft handling, knowledge of Standard Operating Procedures, Knowledge of aircraft systems and knowledge of routes.

18.10.35. Witness No.24 the Director Flight Operations PIA stated that First Officer Manzar Masood was the weakest among his group during training.

18.10.36. Witness No.24 stated that no other pilot of Manzar's group was given extra hours during training.

18.10.37. Witness No.24 stated that after his P-2 endorsement, because of his weakness shown during training it was decided that F/O Manzar fly an additional 100 hrs under supervision of Supervisory Captains before being cleared for independent P-2 flying on the line. A letter of caution was also issued to First Officer Manzar Masood to improve his flying ability during the allotted hours. (Appendix "S").

18.10.38. Witness No.24 stated that none of the Pilots from F/O Manzar Masood's group were sent on to the Twin Otter aircraft.

/18.10.39. Witness

- 18.10.39. Witness No.24 stated emphatically that no flying training instructions are to be imparted during a route check on revenue flights.
- 18.10.40. Witness No.24 stated that the check Captain is supposed to take over the controls of the aircraft from the Pilot or Co-pilot under check:-
- (a) When ATC instructions with regards to heading, heights or speeds are being violated.
 - (b) When the pilot under check manoeuvres the aircraft in a way that it becomes uncomfortable for the passengers.
 - (c) The most important is when the safety of the aircraft is being compromised, and the check Pilots are thoroughly briefed not to allow a situation to an extent that it becomes difficult for them to control.
- 18.10.41. Witness No.25 a Training Captain at Islamabad stated that First Officer Manzar Masood's performance deteriorated under stress.
- 18.10.42. Witness No.25 in his assessment of Captain Raza Zaidi was of the opinion that he had the capabilities of becoming a flight instructor.
- 18.10.43. Witness No.23 stated that he asked Wg.Cdr.Bilal if search and rescue operations had been launched, and was informed by Bilal that facilities for night Search and Rescue were not available.
- 18.10.44. Witness No.23 stated that it is a normal practice to fly pilots under supervision at Islamabad Base.
- 18.10.45. Witness No.23 stated that no written progress reports were raised on F/O Manzar Masood. However, Chief Pilot Training was briefed by him verbally and regularly.

19. DISCUSSION

- 19.1. Before recording the findings, some points require further discussion to enable reviewing authority to better understand the considerations by the investigator in reaching these findings. In these discussions of the various points evidence from all available sources has been considered. The evidence has been evaluated in the relevant areas of witnesses, documents, scene of accident operations procedure and flight recorders evidence in arriving at the causes for the accident. An accident rarely occurs in isolation. It is but a manifestation of a series of over-sights, mistakes, judgement, lack of/poor planning, poor supervision and failure to adhere to laid down standards. This accident to PIA F-27 AP-AUX is a classic illustration of factors leading up to an avoidable accident that resulted in loss of valuable lives and property. The following discussion considers various causal factors which may have caused or contributed to this accident.
- 19.2. Let it be understood at the outset of this discussion that a Route Check Captain though a Supervisory Captain is not a Flight Instructor, and is, therefore, not authorised to impart flying training. His duty is to monitor the pilot under supervision, and post flight brief him on any mistakes he may have made in procedures, and advise him on how to correct the faults observed, thus allowing the pilot concerned to amass flying experience and improve on any weaknesses in airline procedures, including instrument procedures and radio work. The Pilot-in-Command of an aircraft has total responsibility for the safety of the aircraft and passengers during the period of operation and should not let a situation develop which could jeopardise safety. A Route Check Captain is an experienced Captain on the equipment,

/who is

who is selected and trained for the purpose of conducting route checks of Captains and Co-pilots flying that equipment. During a route check or Supervisory flight the Route Check Captain who is always the designated Pilot-in-Command is expected to take over control of the aircraft if the safety of the aircraft is being jeopardised by the Pilot under check/supervision well in time so that the situation can be corrected. Further any Pilot-in-Command permitting his Co-pilot to operate the flight in any phase is required to assume control of the aircraft well in time, when in his judgement he considers that the safety of the flight is being jeopardised. It follows therefore, that no matter the level of experience or flying ability of the Co-pilot, a situation where the safety of flight of the aircraft is jeopardised by the handling of the controls by the Co-pilot to an extent where correction of the situation is not possible should never arise.

- 19.3. **The Co-Pilots Flying Ability.** First Officer Manzar Masood, one of a batch of 19 Cadet Pilots, was inducted into PIA on 22nd May, 1986. On induction his total flying experience was 326.45 hrs on light single engined aircraft, mainly the Cessna-150. Of his total flying experience at the time of induction 269.40 hrs were in command and 57.05 hrs were dual under instruction. During his conversion onto the Fokker F-27 F/O Manzar underwent 20.55 hrs of flying training which included an additional two hours above the normal flying hours allotted for training. He was checked as satisfactory and recommended for under Supervision flying of 25 hours, which he completed satisfactorily from Karachi Base. Upon completion of his under supervision hours PIA applied for and recommended F/O Manzar for type endorsement of F-27 as Co-pilot on his C.P.L. The C.A.A after checking

the pilots training records endorsed the Pilot's C.P.L for F-27 type aircraft as a Co-pilot, thereby clearing F/O Manzar Masood, who was the weakest flyer in his batch, to fly F-27 aircraft as a Co-pilot. No test or check of the pilot's ability was carried out by C.A.A because the C.A.A presently do not have the organisation or personnel to under-take such checks. As has been the practice being followed in the past, the PIA conducted the checks and certified, that the Pilot, First Officer Manzar Masood was fit for issue of Co-pilot status on the F-27 type aircraft. After the licence of First Officer Manzar Masood had been endorsed, the Director Operations, in accordance with PIA policy, after reviewing the Pilot's training records decided that First Officer Manzar Masood should fly a further 100 hours of under supervision flying with supervisory pilots and his progress be monitored. On completion of this additional under-supervision flying, consideration would be given to clearing him for independent operation as P-2 on the F-27. It may be noted that though F/O Manzar Masood at time of endorsement of his licence for P-2 was certified as being of satisfactory standard for such endorsement, yet he was required to undergo an additional 100 hrs of under supervision flying which is four times greater than the initial 25 hours supervised flying completed by other members of his batch, and indeed First Officer Manzar Masood himself. The foregoing illustrates a requirement for C.A.A to develop an organisation, and method of conducting tests, that will be more acceptable than the existing system, where Instructor Pilots who themselves are conducting the training, also carry out the final check flights. Possibly satisfactory results can be achieved by

/appointing

appointing independent Check Flight Instructors from within PIA to conduct the checks on behalf of the C.A.A. These instructors should have no involvement in the training of the Cadet Pilots. Short of employing its own current Flight Inspector on the F-27, where maintenance of currency is a problem, the use of specific C.A.A. appointies from within PIAC appears to be the best solution.

- 19.4. **F-27 and DHC6 Aircraft.** After completion of their flying training and under supervision flying at Karachi, the pilots of the batch were considered for posting onto two different types of aircraft, namely the F-27 and DHC6 Twin Otter. The DHC 6 is a relatively simple aircraft to operate in comparison with the F-27. It has been noted that the most experienced Pilots with flying experience in excess of 3,000 hours were sent to the DHC 6 the relatively simpler aircraft, whilst a weak case like F/O Manzar with 350 hours of total flying experience was posted on Fokkers. It is the opinion of the investigators, that weaker/marginal cases like F/O Manzar should have been posted to the DHC 6 to build up his experience before being posted to fly the F-27..
- 19.5. In view of the fact that First Officer Manzar Masood had not been cleared for independent Co-pilot operation, though technically he was qualified as a P-2 on the F-27, and in view of the fact that he was undergoing his final route check for consideration for independent P-2 operation, a third Pilot was rostered on the flight. First Officer Rehan Ahmed a batch mate of First Officer Manzar Masood was the additional

/Pilot

Pilot who was rostered for the flight. This third pilot was not briefed concerning his duties, nor for that matter was he briefed by the Captain concerning his duties. Evidence indicates that what this third pilot did during the series of flights was left entirely up to him. There is a need for laying down specific instructions concerning the duties of a third pilot rostered on flights in similar circumstances in future.

- 19.6. **Stress on the Co-Pilot.** First Officer Manzar Masood was undergoing a route check after completing the requirement of 100 hours under supervision. The fact that his performance during this route check would form the basis for his further disposal could have imposed considerable stress on him. Further the errors made by him during the PES - LHE sector during the let down at Lahore probably introduced additional stress. Witness No.25 a Training Captain at Islamabad, who had flown with First Officer Manzar Masood, observed that the performance of F/O Manzar deteriorated under stress. This may have been a contributing cause for the poor performance of F/O Manzar during the approach to Peshawar V.O.R and during the let down at Peshawar. Possibly the firing incident, and the operation with all external lights off could have introduced additional stress on F/O Manzar. However, notwithstanding the performance of F/O Manzar, and the reasons for the same, had the Route Check Captain performed his function correctly, and taken over the controls, well in time as he should have the accident would not have occurred. Captains and Supervisory pilots are to be reminded of their responsibility to assume control from their Co-pilots well in time to avoid jeopardising the safety of the flight.

19.7. Firing in the Vicinity of Peshawar Airfield. No evidence was found during investigation to indicate that the firing from the ground reported by the Captain during let down at Peshawar was a direct cause for the accident. The state of flight and the situation in the cockpit was recorded on the C.V.R and the F.D.R. The C.V.R covers a period from 2015 hrs till impact with the ground at 2049.31 hrs PST. The cockpit conversation at the commencement of the tape indicates that the aircraft was heading towards Khushalgarh bridge where it turns towards Peshawar at 12500 feet. It is during this leg to Peshawar that the weak flying ability of F/O Manzar is evidenced, when he has trouble differentiating between a heading and a radial on the V.O.R. When the aircraft was short of Peshawar the A.T.C. Peshawar gave permission for the aircraft to execute a VOR let down for an approach to runway 35. The approach to overhead and the outbound leg of 080 was uneventful. During the inbound leg of 240 degrees at 5500 feet and 8 nautical miles (D.M.E) from the V.O.R, the Captain reported to ATC that there was firing of tracer bullets from the ground "Couple of miles to our left". When the ATC told the aircraft to turn right for an approach to runway 17, the Captain elected to continue his let down for runway 35, informing ATC that the firing was not effecting them and the report was for information, he also informed ATC at this time that he had switched off all external lights. (This last was a precautionary measure). From the Flight Data Recorder information it has been determined that the position of the aircraft at the time of making the report was close to Charsada and the firing observed was emanating from an area close to the

Peshawar - Pindi G.T.Road about five to six miles out of Peshawar. During the subsequent portion of the let down the aircraft did not approach over this area, and other than the Captain telling the Co-pilot that there used to be a lot of firing on the approach to runway 35 at Peshawar but it had become less now, there were no further conversation in the cockpit concerning firing, nor was any further report of firing made by the Captain to the ATC Peshawar. Firing from the ground being a cause for the accident has been ruled out on the basis of evidence available to the investigators. However, the firing did cause enough concern in that the pilots elected to continue the approach with the external lights off, which included the landing lights. Though there are circumstances, such as dust haze or light fog on the approach, which may dictate an approach to land without the landing lights, on a pitch dark, moonless night such as that on 23rd October, 1986 when the accident occurred, the use of landing lights would have assisted the Captain in assessing the aircraft height above the terrain. The lack of landing lights in the conditions prevailing would result in a lower level of height preception and may be a cause for the Captain's failure to judge their proximity to the ground. At the most the non-use of landing lights could be considered as a probable contributing factor in the accident, thus the observed firing from the ground could be considered to have contributed indirectly to the accident.

- 19.8. The firing ^{incidents} ~~indicates~~ at Peshawar have been a source of concern for the pilots for quite some time. The subject has been taken up with various authorities since 1983, but the firing round Peshawar airfield still continues though possibly at a reduced level.

The Civil administration though they have taken measures to stop the activity have not been successful. Let there be no doubt about it, the firing from the ground in the close vicinity of the Peshawar airfield constitutes a very real threat to the safety of aircraft using Peshawar Airfield whether by day or by night. If the firing is not stopped completely and aircraft continue to operate into Peshawar, then sooner or later an aircraft is going to fall victim to this firing, with the accompanying loss of life and property. To date neither the C.A.A nor the PIAC have seriously considered discontinuing passenger flights into and out of Peshawar International Airport. The Investigators are of the opinion that the CAA and the PIA Management must give serious consideration to discontinuing passenger flights into and out of Peshawar till such time that the Civil Administration succeed in stopping firing into the air near the Airport. It is appreciated that this would be a difficult step to take as it would cause inconvenience to passengers originating at Peshawar, but these problems should not be permitted to take precedence over safety of the travelling public.

- 19.9. **Distraction.** First Officer Manzar Masood on completion of the allotted under supervision hours was rostered for a final route check to establish whether he had attained the required level of proficiency to enable a decision to be taken, with regard to his future disposal, by the Director Flight Operations PIA. First Officer Manzar was rostered for a series of flights Islamabad - Peshawar - Lahore - Peshawar, Captain Raza Zaidi a Route Check Captain of Islamabad Base was rostered as Captain on the same series of flights for the purpose of conducting the

route check of F/O Manzar Masood. A third pilot an additional Co-pilot First Officer Rehan Ahmed was rostered on the flight, without briefing concerning his duties either by Flight Operations Islamabad Base or the Captain. As a route check Captain, Captain Raza Zaidi was required to evaluate the performance of F/O Manzar Masood and declare him satisfactory or unsatisfactory. The question of the Captain imparting instruction during this check does not arise. From the CVR however, it is evident that Captain Raza Zaidi extended the scope of his duties to imparting of inflight instructions to F/O Manzar Masood. Instead of monitoring the conduct of the flight, and executing the duties of the Co-pilot since he was the pilot not flying, Captain Zaidi was prompting and reminding F/O Manzar continuously of aircraft heights, heading, speeds and procedures. Captain Raza Zaidi, who is not a Flying Instructor, involved himself in giving instructions to F/O Manzar to an extent where he lost sight of his primary responsibility. While the aircraft with 54 souls on board approached the ground at rates in excess of 850 feet per minute, the Pilot-in-Command Captain Raza Zaidi was prompting the Co-pilot on how to intercept the radial. In doing so, it is obvious from the C.V.R read out, and the FDR read out, that the Captain and the Co-pilot were totally engrossed in chasing the VOR needle at heights less than 400 feet above the ground on a pitch dark night with the landing lights off and failed to monitor the height of the aircraft above the terrain.

- 19.10. Readings from the Flight Data Recorder show that correct headings were not flown during the let down at lower heights. The turn on to out bound 140 from inbound 240 was initiated at 4 DME instead of 2 D.M.E. The out bound radial of 140 was never

/intercepted,

intercepted, in fact the outbound 140 leg was a series of corrections to intercept the radial. The final turn was initiated on prompting by the Captain, as was lowering of the landing gears. At this stage, it is evident from the F.D.R read out that First Officer Manzar Masood executed a steep turn onto finals, this placed the aircraft about a mile to the right of the final approach path. At this stage Captain Raza Zaidi should have taken over control of the aircraft, because they were at a low altitude and conditions did not permit any further errors. Instead just moments before impact with the ground the Captain exclaimed "Buddy Kia Kur Raha Hai," as if the situation was still salvageable. Captain Raza Zaidi a Pilot-in-Command and Route Check Captain at that, exhibited poor judgement, poor airmanship and poor command by attempting to talk the Co-pilot down to a landing, and in so doing got engrossed to such an extent that he failed to take over control in time to avoid the accident. The fact that the aircraft was in 8 to 10 degree nose high attitude with a shallow bank to the right at the time of impact, is indicative that in the final moment the Captain realised that the aircraft was too low and attempted to pull up. If the aircraft had been fitted with a Ground Proximity Warning System (G.P.W.S) a warning of closure with the terrain may have been given early enough to allow for the safe recovery of the aircraft by the Captain. Consideration may be given to installing G.P.W.S equipment in the F-27 aircraft.

- 19.11. Serviceability of F-27 AP-AUX. From evidence obtained from the documents of the aircraft, evidence from recorders, witnesses and examination

of ground marks and the wreckage, it has been concluded with certainty that all aircraft systems, including flight controls and engines were operating normally right upto first impact with the ground. No structural failure had occurred prior to the first impact, which occurred just four seconds after the Captain had acknowledged final clearance for landing on runway 35 Peshawar. This was the last communication by the aircraft with the A.T.C.

19.12. Incapacitation of the Flight Crew. After the accident, the District Commissioner, Peshawar, on the request of the Police, gave a waiver from the requirement of Autopsy, and the bodies were released. The Airport Manager arrived at the hospital only after the waiver had been given and the bodies released. No rule that makes autopsy of passengers and crew mandatory exists in the Aircraft Rules 1978, however, Civil Law requires an autopsy to be performed on bodies of persons killed accidentally, and it is under this Civil Law that the autopsy of fatally injured passengers and flight crew can and must be conducted.

19.13. Autopsies are conducted with the purpose of establishing the cause of death. In the case of the cockpit crew such autopsies and histopathological examinations confirm whether a crew member suffered incapacitation or death prior to impact and thus give an important lead to the investigators in their search for the real cause of accidents. Autopsies performed on bodies of crew and passengers could produce evidence of unlawful interference and sabotage by explosive devices, which may be the only evidence available to the investigators at the time and would lead to use of special investigative techniques and the calling in of specialists to

assist the investigation. For this reason the Airport Managers and the Civil Administration country wide must be made aware of the importance of such examinations in the case of aircraft accidents. Bodies of aircraft accident Victims should be retained till such time that the Investigator in Charge of the accident investigation clears them for release. It is fortunate that in the case of this accident that sufficient evidence was available to prove that incapacitation of the Flight Crew was not a factor. If this evidence were not available, then there would have been no alternative to exhuming the bodies for examination, with the accompanying pain caused to near and dear ones of the deceased.

- 19.14. **Search and Rescue.** The last communication received by the A.T.C Peshawar from the aircraft was acknowledgement of the final clearance to land on runway 35. The aircraft having already indicated that he was on finals and requested clearance to land. The logical place to search for the aircraft would be back along the approach path to the runway. Peshawar Airport, and indeed most airports in Pakistan do not have a night search by helicopter capability. In Peshawar though the PAF have a helicopter rescue flight, the helicopter is not instrumented for night search and was, therefore, not launched. Though the individual controlling the proceeding from the ATC, the Officer Commanding Wing, did initiate a check within the airfield boundaries to determine if the aircraft had landed short of the runway threshold, because of the rough terrain and an incorrect information from the Radar failed to send a ground search party back along the extended center line of the runway, which in the opinion of the investigators with hind-sight was the logical action to take. Had such a ground search party been

/launched,

launched, it is probable that they would have located the aircraft in a short while, since it lay about 2.5 nautical miles from the threshold of the runway, and rescue action would have been initiated much earlier. In the event, however, all elements of the rescue party waited for news to come in concerning the location of the aircraft from agencies notified that the aircraft was missing in accordance with the accident plan of PAF Base, Peshawar. News was received about two hours after the aircraft was missing and the rescue party reached the scene some fifteen minutes later. On their arrival they found the Captain and the Co-pilot trapped in the wreckage of the cockpit and removed them, and found on examination that they were dead. Evidence from witnesses indicates that the Captain was alive for some time after the accident occurred, but could not be removed because of sparking occurring when attempts were made, and because of fear of starting a fire he was not removed. Had qualified rescuers arrived earlier, the possibility exists that the Captain may have survived, and also that some other persons who died may have been saved. There is need to take action to ensure that night search and rescue facilities are available at all airports, and specially those which have passenger aircraft operation at night, keeping in view the fact that early rescue can and will result in more people being saved in the event of an accident.

- 19.15. During investigation it was noted that at Peshawar, the PAF had their own pre-accident plan, and the Civil Aviation Airport Manager had his own "Disaster Plan". In such a situation on a joint PAF-CAA user airfield the likelihood is that the PAF authorities would activate their own plan and the CAA Disaster Plan would not be activated fully if at all. On an airfield there should be only one plan laying down

actions to be taken and laying down command responsibility, so that all agencies work in harmony. There is an immediate need for the Headquarters CAA to co-ordinate with Air Headquarters to ensure that on joint user airfields a single Disaster Plan is activated, spelling out command and control requirements. Director Operation CAA has already been informed of the need for Co-ordination with the PAE and is taking necessary action.

19.16. **Proficiency and Standardisation.** It is evident from the foregoing that the Pilot-in-Command failed to follow proper procedures, and in fact went beyond his charter as a Route Check Captain by attempting to give inflight instruction to the Co-pilot under final check by trying to talk him down to a successful landing. Additionally a call of "Runway in Sight" was not made by the Captain as required by procedure. This is an important call and requires the pilot flying to maintain M.D.A till the call is given, at which time he would look outside, and continue the approach. In this accident the Pilot-in-Command is considered to be directly responsible for the accident, though certain conditions in the supervisory area may also have contributed. These conditions relate to supervisory shortcomings both in the C.A.A and in the PIA. Such shortcomings in the system unless they are rectified may continue to create an environment which is hazardous and unsafe, and result in further accidents. If accidents are to be prevented, safe conditions must be provided.

19.17. The Primary responsibility of PIA as an air carrier is to ensure the safety of the revenue paying passengers. Indeed, it is expected that an airlines major efforts would be directed towards ensuring the

carriage of its passengers and cargo to their destinations safely. An accident prone airline cannot provide safe transportation, thus failing in its primary responsibility. This accident is the second major in-flight-accident to PIA aircraft in a short span of eight months resulting in an avoidable loss of thirteen lives and injuries to 28 persons out of whom some may be disabled for life. Both these accidents, the Boeing 747 wheels up landing and this accident to Fokker F-27 AP-AUX were caused when the Pilots-in-Command failed to comply with the standard aircraft operating procedures. The previous year one Twin Otter DHC-6 aircraft was destroyed and another seriously damaged, once again the causal factor was - non compliance with recommended procedures. From a consideration of all three accidents it clearly shows that there is a propensity in the airline to disregard the laid down regulations and procedures. The international accident rate during the year, 1985, the worst safety year in aviation history was 1.06 accidents per 100,000 flying hours. PIA in 1986 recorded an accident rate of 1.97 accidents per 100,000 flying hours.

Accident
Rate Per
100,000 hrs.

19.18. Operational Safety of aircraft depends largely on the professional prowess of the pilots. An airline pilot is responsible for ensuring the safety of flight of the aircraft he operates, and also the safety and well being of the passengers. This requires a high standard of pilot training and pilot ability. The airline, therefore, needs a system which monitors continuously and closely the professional abilities and competence of its pilots. The supervisors play a vital role by defining the flying standards and ensuring that these are maintained. The flying standards supervisors are the backbone of safe and

efficient flight operations in the airline. Considering the important role they play such supervisors ought to be professionally the most competent in the airline. Selection of these supervisory pilots should be purely on merit. Though PIA has a system for standardisation through route check Captains, Instructor Pilots and System Chiefs, it has been noted that for assigning supervisors, the major consideration is seniority on equipment, professional ability in such a system leans heavily in favour of seniority. Such a system where professional ability is not the main criteria for selection to supervisory posts, permits individuals of marginal abilities to reach supervisor levels mainly on the basis of length of service. The existing procedure for the selection and appointment of supervisory pilots need review.

- 19.19. The Civil Aviation Authority of Pakistan is entrusted with responsibility to ensure the safe conduct of operation of Civil Aircraft by providing adequate facilities for the operation of aircraft, and also by monitoring the conduct of such operations. As part of its function the CAA has a responsibility for maintenance of flying standards by aircrew of the Operator. As such all pilots seeking aircraft flying licences and ratings should be tested by the CAA who grant the licences. Presently the C.A.A does not have the organisation and qualified manpower to undertake such tests/checks on all aircraft types operated by PIA. The system being followed right now has been proved as inadequate in the wake of the last two major flying accidents. There is an urgent need to review the system being followed with the object of making it effective. In view of the difficulty of obtaining adequately qualified pilots for the job, and the prohibitive costs of maintaining their currency the

CAA should select pilots operating in PIA, who have the necessary competence and professional ability for the task. These Pilots may then be nominated to conduct competency checks and flight checks for licencing on behalf of the C.A.A. Full Co-operation of PIA Management and proper co-ordination between CAA and PIA Management is a pre-requisite for success of such a system. Consideration by CAA and PIA needs to be given to this requirement and necessary agreements reached before implementation.

20. FINDINGS

20.1. From the foregoing investigation and discussion the investigators find:-

20.1.1. Pakistan International Airlines aircraft Fokker F-27 Reg AP-AUX operating scheduled domestic passenger flight PK-672 from Lahore to Peshawar on 23rd Oct. 1986 crashed while on final approach to Runway 35 of Peshawar International Airport at 20 hours 44 minutes 31.5 seconds PST at a place 2.2 N.M. from threshold of runway 35 slightly left of the extended center line of the runway on radial 182 from Peshawar VOR.

20.1.2. As a result of the accident, of the 54 souls on board, 13 occupants were fatally injured and 28 occupants sustained injuries, seven of the injured were released after treatment and 21 were hospitalized including the non-flying third pilot F/O Rehan Ahmed.

/20.1.3. Fokker

- 20.1.3. Fokker F-27 aircraft AP-AUX alongwith its engines, propellers and ancillary equipment sustained substantial damage as a result of the accident and has been assessed as totally destroyed.
- 20.1.4. The aircraft was fully certificated and had been maintained to the laid down standards. The aircraft Center of Gravity was within limits and the aircraft was serviceable at the time of accident.
- 20.1.5. Three Cockpit Crew were rostered for the flight and were on board the aircraft.
- 20.1.6. Captain Raza Zaidi P-No.37512 holding valid ALTP Licence No.635 was the Pilot-in-Command and route check Captain for the flight.
- 20.1.7. First Officer Manzar Masood P.NO.45612 holding valid C.P.L.NO.911 on the F-27 aircraft in group Two, was the Co-Pilot under route check and on the controls.
- 20.1.8. First Officer Rehan Ahmed P.NO.45620 holding valid CPL No.810 on the F-27 aircraft in group Two was the third pilot on the flight. He had received no briefing regarding his duties from either the Flight Operations or the Captain. He elected to observe whilst standing behind the pilots.flying.
- 20.1.9. Captain Raza Zaidi had been appointed as a route check captain on F-27 aircraft on 9.9.86 and was relatively in-experienced as a

route check captain though adequately experienced as a Pilot-in-Command on the F-27 aircraft.

- 20.1.10. F/O Rehan Ahmed and F/O Manzar Masood were from the same batch which was inducted into PIA on 22nd May, 1986. F/O Masood after completing his training and under supervision flying of 25 hours was the only trainee required to undergo a further 100 hrs of under-supervision flying on the line before being cleared by PIA for independent operations as P-2 on the line. He was the weakest of his batch. No checks or tests were carried out by C.A.A. before endorsement of any of their licences because CAA does not have the effort to conduct such tests and accepts certification from PIA as to the fitness of the Pilots for endorsement of licences.

- 20.1.11. On completion of training, the Pilots of this batch were posted to DHC-6 (Twin Otter) and F-27 aircraft. Some of the more experienced pilots were posted on To Twin Otters whereas F/O Manzar a weak/marginal case was posted on to F-27 aircraft.

- 20.1.12. Evidence shows that F/O Manzar had not achieved the requisite standards and was still having problems differentiating between tracks and radials.

- 20.1.13. Throughout the recorded flight Capt. Zaidi the Pilot-in-Command imparted flight instructions to F/O Masood, whereas in the circumstances of the flight which was a final route check, he should have observed

the performance of the Co-pilot and taken over at any stage when the safety of the flight was being compromised.

20114. The flight PK-672 was uneventful till the in bound leg of 240 at 5500 feet, 8 DME from Peshawar V.O.R at which time the Capt. reported ground firing a couple of miles to his left but elected to continue let down to R/W 35 with all external lights off. No further reports of ground firing were made nor was there any indication from the cockpit conversation about the firing or any other emergencies. Firing did not directly contribute towards the accident though non use of landing lights may have contributed to failure to recognise low altitudes in prevailing conditions.
20115. Reports regarding such firing incidents around Peshawar airport have been lodged with various authorities including Provincial and Central Government, however, firing continues unabated.
20116. The final turn was executed with a steep bank placing the aircraft to the right of the required VOR radial. The aircraft heights were monitored upto M.D.A. Thereafter, the Pilots became engrossed in attempting to intercept the radial 177 and failed to monitor aircraft heights till just before impact.
20117. At the time of first impact, the configuration of the aircraft was landing gears down and locked, Flaps down $16\frac{1}{2}^{\circ}$, landing lights extended but off. Aircraft attitude at impact was $8-10^{\circ}$ nose high, $5-10^{\circ}$ bank to the right,

/speed

speed between 120 - 125 kts. Rate of descent was in excess of 850 feet/min.

- 20.1.18. Break-up of the aircraft commenced after first impact. Second impact occurred in a steep nose down altitude 315 feet further ahead. The aircraft nosed over on to its back and skidded to a halt 300 feet further ahead.
- 20.1.19. No pre-impact failures of the aircraft systems and structure occurred.
- 20.1.20. Aircraft engines were operating normally at power setting commensurate with the final approach power at the time of impact.
- 20.1.21. Fuel tanks maintained their integrity and no severe fuel leaks occurred. No pre or post impact fire occurred.
- 20.1.22. Initial rescue of passengers was effected by the Afghan refugees and police who arrived on the scene shortly after the accident.
- 20.1.23. Night search facilities are not available at Peshawar Airport.
- 20.1.24. A ground search along the approach was not attempted except within the airfield boundary.
- 20.1.25. The wreckage was located two hours after the accident. A joint CAA, PAF rescue party set off thereafter and reached the scene of accident at 2300 hours. The Civil Administration authorities reached the scene at the same time.

/20.1.26. The rescue

- 20.1.26. The rescue party found that the occupants had already been evacuated except for the Captain and Co-pilot Manzar Masood who were still trapped in the cockpit wreckage. The untrained rescuers were unable to remove the Capt. and the Co-pilot because of sparking occurring in the cockpit area when they attempted to do so and for fear of fire. Witness evidence indicates that Capt. Zaidi was alive for some time after the accident. Capt. Zaidi and F/O Masood were evacuated by the rescue party who found them dead.
- 20.1.27. The dead bodies of passengers and the crew were handed over to their next of kin after clearance by the Deputy Commissioner Peshawar who waived the autopsy requirement on request of the Police.
- 20.1.28. Aircraft rules 1978 do not contain a mandatory provision for the autopsy of fatally injured crew and passengers, though, Civil Law requires autopsy to be performed on bodies of persons killed accidentally.
- 20.1.29. Progress of the flight as recorded by the flight recorders on board the aircraft confirms that the flight crew were not incapacitated in any way what-so-ever prior to impact.
- 20.1.30. The Captain did not make a call of runway in sight.
- 20.1.31. At Peshawar, which is a joint PAF, CAA user airfield, the emergency plans of the two agencies are separate.

20.1.32. Meteorological conditions were not a causal factor in the accident.

20.1.33. Aerodrome facilities were available and functioning normally and were not a causal factor in the accident.

20.2. **Cause of the Accident** From an analysis of the available evidence, the investigators are of the opinion that the probable cause of the accident to PIA Fokker F-27 aircraft Registration AP-AUX Operating PK-672 on 23rd Oct 1986 was due to the failure on the part of Capt.S.M.Raza Zaidi t e Pilot-in-Command and Route Check Captain in that he, failed to ensure that the flight was conducted in a safe manner by failing to assume control of the aircraft when the conditions of flight require so. He failed to comply with the standard operating procedures as a Route-Check Pilot by imparting instructions to the Co-pilot at a stage of flight requiring his taking over of the ai ra t controls for safety of the aircraft and its passengers. He permitted the aircraft to be flown in a manner as to cause the avoidable loss of lives and property. In having allowed the aircraft to descend below the Minimum Descent Altitudes (400 feet Above Ground Level) leading to the aircraft impacting the ground, Capt.S.M.Raza Zaidi P-37512 ALTP No.635 is considered responsible for the accident to PIA Fokker F-27 aircraft AP-AUX.

21.RECOMMENDATIONS

21.1. In view of the findings in this investigation and the observations by the investigators, the following recommendations are made:

- 21.1.1.✓ CAA should review the existing flight standards organization with a view to taking action to ensure that an acceptable set up for conducting flight checks for issuance of pilot licences, ratings and the carrying out of proficiency and standardization checks. This may be achieved by appointing independent check flight instructors from within PIA. These instructors should have no involvement in training of aircrew. Such check Captains should in the first instance be selected by CAA with the assistance of FAA, CAA (UK) or I.C.A.O.
- 21.1.2.✓ PIA to review the existing procedure for the selection and appointment of supervisory pilots with the aim of ensuring that the basis of selection is mainly professional ability. Final approval of such supervisory pilots will however remain with CAA.
- 21.1.3.✓ PIA remind Captains and supervisory pilots of their responsibilities to assume control from their Co-pilots well in time to avoid jeopardizing the safety of flight.
- 21.1.4.✓ PIA to ensure that inflight instructions are imparted on training flights only and by qualified flight instructors alone.
- 21.1.5.✓ PIA Operations Management to ensure that specified instructions/requirements are being observed and all persons are strapped in seats for all aircraft take-offs and landings.
- 21.1.6.✓ The CAA and PIA management to give serious consideration to discontinuation of passenger

flights into or out of Peshawar till such time that the Civil Administrations succeeds in stopping the firing into the air around the airport.

- 21.1.7. It is to be ensured by Headquarters Civil Aviation Authority in consultation with PAF HQ that only one emergency plan is evolved for all joint user airports.
- 21.1.8.+ CAA to take steps to ensure that night rescue and search facilities are available at all airports where night operations are conducted.
- 21.1.9. Airport Managers and Civil Administration authorities country-wide are to be made aware of the importance of autopsies on victims of aircraft accidents.
- 21.1.10. PIA to issue specific instructions regarding third pilot duties and ensure compliance by Captains.
- 21.1.11. PIA consider posting of weaker/marginal cases to DHC-6 (TWIN OTTER) to build up experience before posting them to fly the Fokker F-27 aircraft or advanced equipement.

21.1.12. Consideration

21.1.12. Consideration be given by CAA and PIA to the installation of G.P.W.S. (Ground Proximity Warning System) or radio altimeter with altitude warning system onboard all PIA aircraft ~~operating~~ passenger flights at night.

APP "L₁"



FIRST POINT OF IMPACT (ARROW) WHERE RIGHT MAIN WHEEL IMPACTED.

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APP "L₂"



ARROW POINTS TO MARKS MADE BY THE REAR UNDER SURFACE OF THE FUSELAGE. TOILET DRAIN WAS FOUND AT THIS POINT.

APP "L3"



TAIL CONE OF RIGHT ENGINE NACELLE WHICH WAS RIPPED OFF WHEN STRUCK BY SOME PART OF THE RIGHT MAIN LANDING GEAR WHICH BROKE OFF ON FIRST IMPACT.

APP "L4"



RIM OF THE RIGHT STARBOARD MAIN WHEEL. FAILURE OCCURRED TO OUTBOARD WHEEL ON INITIAL IMPACT.

APP. "L5"



STARBOARD MAIN LANDING GEAR STRUT WHICH
BROKE OFF ON INITIAL IMPACT.

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APP "L6"



VIEW OF STARBOARD MAIN GEAR DOWN LOCK
IN UNLOCKED CONDITION.

APP "L7"



VIEW OF NOSE LANDING GEAR WHICH WAS DAMAGE AT SECOND IMPACT. NOSE GEAR DAMAGE INDICATES IT WAS DOWN AND LOCKED AT TIME OF THIS IMPACT

APP "L8"



VIEW OF LEFT ENGINE PROPELLER. ENGINE WAS DEVELOPING POWER WHEN BLADES CONTACTED THE GROUND AFTER SECOND IMPACT AS THE AIRCRAFT WAS NOSING OVER.

APP "L₉"



VIEW OF RIGHT ENGINE PROPELLER. ENGINE WAS DEVELOPING POWER WHEN BLADES CONTACTED THE GROUND AFTER SECOND IMPACT AS THE AIRCRAFT WAS NOSING OVER. MAIN WRECKAGE CAN BE SEEN IN THE BACKGROUND.

APP "L₁₀"



SLASH MARKS MADE BY LEFT PROPELLER BLADES ALL FOUR BLADES STRUCK THE GROUND.

APP "L11"



SLASH MARKS MADE BY RIGHT PROPELLER BLADES. ARROW INDICATES POINT WHERE THE SPINNER DUG INTO THE GROUND AS THE AIRCRAFT WAS NOSING OVER AFTER SECOND IMPACT WITH THE GROUND.

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APP "L12"



VIEW OF THE DAMAGED LEADING EDGE OF THE LEFT WING WHICH OCCURRED WHEN THE WING CONTACTED THE GROUND DURING THE NOSE OVER AFTER SECOND IMPACT. WING IS INVERTED AND BENDING IS TOWARDS THE LOWER SURFACE.

APP "L13"



VIEW OF THE FUSELAGE, LEFT WING AND LEFT ENGINE NACELLE. NOTE THE UNDAMAGED TAIL CONE. AND THE LANDING GEAR DOORS ALMOST CLOSED. THE UNDAMAGED LEFT MAIN LANDING GEAR ASSEMBLY OF THE AIRCRAFT WAS FOUND IN AN UNLOCKED CONDITION IN THE NACELLE. THE ENGINE HAD BEEN SEVERELY CRUSHED. NOTE ALSO FLAPS IN THE 26 DEGREE DOWN POSITION. THE CRUSHED COCKPIT AND GALLEY AREA CAN BE SEEN TO THE RIGHT.

APP "L14"



A VIEW FROM THE FRONT OF THE AIRCRAFT. NOTE THAT DAMAGE OCCURRED DURING THE SECOND IMPACT AND SUBSEQUENT NOSE OVER AND EXTENDS TO THE FIRST ROW OF PASSENGER SEATS AT THE FORWARD END OF THE CABIN.

APP "L15"



A VIEW OF THE INSIDE OF THE CABIN

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APP "L16"



ARROW INDICATES DAMAGE TO THE REAR UNDERSURFACE OF THE FUSELAGE. THIS DAMAGE PROCEEDS BACK TO A POINT JUST AHEAD OF THE EMPENNAGE. THE FUSELAGE IS INVERTED WHEREAS THE EMPENNAGE IS FIN UP. IT WAS TURNED THROUGH 180 DEGREES.