INVESTIGATION REPORT ON
ACCIDENT TO M/S. KHI\N AVIATION CSSSNA 185 AP-BBC
WHICH OCCURRED ON 8-10-1982 AT PASNI AIRPORT

Authority : DGCA Memorandum No. IB/7-16/82 dated 9th October 1982 (App. 'A')

1. AIRCRAFT INFORM. TION

1.1.	Aircraft type & Manufacture Serial No.	Cessna-185F 18503722
1.2.	Nationality & Registration :rvi.arks	AP-BBC
1.3.	Engine type,installation & Manufacturer's Serial No.	Continental 10-520D Front Installation Puller Type
1.4.	Propeller Type	MCCAULE. Consta t speed and hydrauli-cally actuated with low pitch and high pitch setting.
1.5.	C of R No. & Validity	552 Valid
1.6.	C of A & Validity	505 Valid
1.7.	C of M & Validity	361 Valid
1.8.	Date of construction	1979
1.9.	Owner	M/s. Sattar Aviation Karachi
1.10.	Operator	M/s. Khan Aviation Karachi
1.11.	Max. Gross Weight permitted	3350 lbs.
1.11.1.	Weight at the time of accident	over 3588.5 lbs. (./I.pp'.D')
1.11.2.	Excess weight at the time of take-off	238.5 lbs. {App. 'D')
1.12.	C of G	Not calculated by the Pilot for this flight
1.13.	Previous Accidents	Nil
1.14.	History of Airframe	
1.14.1.	Hours since new	575.20
1.14.2.	Hours since lc:i.stC of A	189.40
1.14.3.	Hours since last periodic inspection	2.00
1.14.4	Modification	Up-to-date
1.14.5.	Recent history of airframe	Nil
1.15.	History of Engine	
1.15.1.	Hours 1=,ince new	575.20
1.15.2.	Hours since last overhaul	575.20

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1.15.3.	Hours since periodic inspection	2.00
1.15.4.	Modification	Up-to-date

2. CREW' INFORMATION

2.1 ·	Pilot in-command	Mr. Syed Asif Saeed
2.2.	Date of birth	20.12.1952
2.3.	Licence type held & No.	ALTP No.587 CPL N0.1288 PPL No. 1622 FOO No. 352 All licence.s valid at the time of accident.
2.4.	Type rating held	Cessna 150 Cessna 185, Cessna 206, Piper Aztec (Twin Engine)
2.5.	F.R.T.O. Licence No.	1869 valid
2.6.	Medical status	Fit for pilot duties (BXamined on 3.6.82)
2.7.	Total Flying Experience	2416.15 hrs. (All flying don on PAF Jet aircraft except approx.80.00 hrs. on . general aviation aircraft)
2.8.	Total in command	2180.40 hours
2.9.	Total in command on type accident occurred	**75.05** "
2.10.	Total experience as F.I. on type	Nil

3. HISTORY OF FLIGHT

3.1. On the 8th October, 1982, Mr. Syed Asif Saeed holder of a valid "'LTP licence No. 587 with Flight Instructor Rating endorsed on it, was detailed by his employer,M/s. Khan Aviation, to ·operate a Cessna 185F type of aircraft bearing Nationality and Registration marks AP-BBC to Pasni and back. The outbound fli.ght was a positioning flight. Nothing eventful occurred during this flight. The aircraft landed Pasni safely. The pilot did not enter any snag on the aircraft voyage report.

3.2. At Pasni Airport he was handed over eight large and one comparatively small gunny bag containing prawns. He loaded this cargo in the aircraft without verifying its actual weight. He also accommodated one passenger in the non-operating seat. tfter starting the engine, he taxied the aircraft to runway 24 and after reaching the threshold he carried out runup and pre-take off checks. Having

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satisfied himself with aircraf status, he opened povrer to execute take-off. Reaching a speed in the neighbourhood of 50Kts., the pilot raised the tail to prepare for a lift-off. The aircraft developed a right swing. He applied correction which appears to be over correction. As a result of this the aircraft entered a left swing. The pilot heard cracking noise from the right hand landing-gear. On hearing this noise he decided to abort take-off.

3.3. He attempted to lower his tail and applied brakes simultaneously. This attempt was made when the aircraft had started to swing to the left on the runway The pilot's efforts brought no results to stop the aircraft. The aircraft departed the runway surface and came to rest 100 feet from the South Eastern edge of the runway. Before departing the runway, the right landing gear broke. The pilot and the passenger evacuated the aeroplane through the left entry door, the right one being blocked. They exuerienced some difficulty in evacuation. There was no fire during or after the accident.

4. INJURY TO PERSONS

4.1. Mr. Syed Asif Saeed, .the pilot and Mr. Wahid Bllksh, the passenger, escaped unhurt. There was no injury to tnird party.

5. **DAMAGE** TO AIRCRP..FT

5.1. The aircraft was substantially damaged. (App.'G').

6. OTHER DAMAGE

6.1. As a result of remaining in the locked aircraft for 28 hours the cargo of prawns in gunny bags weighing 501 Kgs. became unfit for human consumption.

7. MEI'EOROLOGICAL CONDITIONS

7.1. Weather was fair (App.'C' Answer 22)

7.2. Weather was not a factor

8. AIDS TO NAVIGATION

8.1. No navigational aids are provided at this airport

8.2. Aids to navigation were not a factor in this accident.

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9. COMMUNICATION

9.1. There are no A.T.C. facilities at this airport.

9.2. The aircraft is fitted with multichannel VHF/RT Set. Pilot has not renorted any malfunction of this set.

9.3. Communication was not a factor.

10. AERODROME *AND* GROUND FACILITIES

10.1. Pasni Airport has one runway 24/06 which is 9000 feet long arid 150 feet wide. This airfield is not manned by the Department of Civil Aviation. One Assistant Director ADA looks after the maintenance of runway and terminal building.

10.2. No fire fighting facilities exist at this airport. M/s. PIAC offer regular air service to this station. They have 4 movements a day using F-27 type of aircraft. Had the aircraft developed fire, there would have been no way to extinguish it.

11. FLIGHT RECORDERS

11.1. Not fitted nor required to be fitted.

12. WRECKAGE

12.1. This damaged aircraft (App. 'U1') which was lying 100 feet South East of the runway, was identified as Cessna 185F be ring Nationality and Registration marks AP-BBC. The wreckage was in one piece except for the right main gear assembly, right main wheel and propeller tip. The right hand gear assembly and the right hand wheel were lying close to the wreckage (App. 'U2'). The propeller tip was found at a distance of approximately 600 feet from the wreckage towards the threshold of runway 24. It h$.d flown away due to centrifugal force after its breakage from the propell' r. One bolt and one screw, both corroded, were also picked up from the runway.

12.2. Mr. Noor Nabi, an aircraft engineer, officer on special duty in the Aeronautical Inspection Directorate, l)epartment of Civil Aviation and Investir:-ator appointed by the the Director General for this investigation, examined the bolt and the

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screw mentioned in the preceding para. His considered opinion is that these did not belong to Cessna aircraft under investigation. the above fact was also confirmed by Mr. M.I.Khan, Aircraft Engineer, holding Cessna-185 rating on his A.M.E. Licence.

12.3. The fact that the screw and the bolt were corroded itself confirms the fact that these have not been in use for considerable length of time.

12.4. Propeller tip was found approximately 600 feet short of the mark where the left main gear had departed the runway. This 600 feet area was scanned by the Investigating Team. No evidence was found on the runway surface to show that the tip had come in contact with the runway. It is the opinion of the investigators that this part flew off when the propeller contacted the soft ground after the aircraft had departed the runway surface. This opinion is based on the fact that had the tip flown off at a position other than the aircraft being at 90° to the runway, it would not have been thrown to this position.

12.5. Oil seals and wheel bearings were picked up close to the place where the right hand gear had broken. Some brake oil was also found spilled in Kacha close to the edge of the runway, where the above parts were recovered.

12. 6. The main wreckage was found resting on its right wing in Kacha. In addition to the right wing tip, left main gear and belly of the aircraft were also supporting the wreckage. The tail wheel was not in contact with the ground. It could be spun with fingers. One of the propeller blade tip was also touching the ground. (APP-U1)•

12.7. The aircraft was found locked. The wreckage was guarded by a police constable, who was positioned there by the local administration. He confirmed that the wreckage had not been tampered with.

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12.8. Key for the left door was collected from Mr. Shahabuddin, Assistant Director ADA Pa.sni. It was handed over to :Mr.Syed Asif Saeed, Pilot of this aircraft. r.irr.syed Asif Saeed unlocked the door of this Cessna-185F aircraft. He examined the cargo placed inside the cabin. After examining the cargo he confirmed that nothing had been disturbed and everything was .as he had left it.

12.9. The investigator incharge and the investigator examined the cabin of this aircraft. It was noted that the cargo had flexed to the right·side of the cabin. It had also forced against the backs of the Pilot and non-operating seats. Both these seats were noticed at their extreme forward travel position.

12.10. Cargo mentioned in the preceding para was removed from the aircraft cabin in the presence of the investigators and Mr. Syed Asif Saeed. There were nine water soaked gunny bags filled with prawns. Eight of these bags were large while the ninth one was small. The small bag was found resting against the right door. One large bag was also observed to be forcing itself against the right door.

12.11. The water soaked gunny bags were off-loaded .from the cabin of the Cessna-185F aircraft (APF. U-10). These nine bags were weighed on M/S. PIAC Scale. The total weight came to be 501 Kgs or 1102.5 Lbs (App. "D-1 n). It was agreed by the Pilot of this aircraft and the two investigators that weight of these nine bags would have certainly been much more at the time of the occurrence. This opinion was based on the fact that the area under the belly of this aircraft was found wet. It wa.s attributed to the fact that the liquid, which had leaked from these bags, had found its passage through the floor board. A reasonable amount may also have evaporated due to the fact that this commodity was weighed 28 hours after the accident.

12.12. It was noted that the cargo loaded in the cabin of this aircraft was not lashed nor was there any net in the aircraft.

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13. FIRE

13.1. No fire occurred during or after the accident.

13.2. Fire fighting capabilities do not exist at this airport.

14. CRASHWORTHINES-'3

14.1. This was a survivable acci.dent, since no fire occurred.

14.2. Correct use of safety harness prevented injury to the occupants.

14.3. Pilot and non-operating seats are designed to move forward on rails to a position which leaves very limited place for the occupants to evacuate. Such a difficulty was experienced by the occupants of this aircraft during evacuation.

15. TEST *AND* RESEARCH

15:,.1. The right hand main landing gear was sent to M/.3. PIAC's workshop to conduct tests to find out service-ability status of brakes. It was also intended to determine whether the wheel assembly had any signs of pre-accident cracks/fatigue marks.

15.2. Tests carried out by M/8. PIAC Engineering shows that brake operation on the right hand main gear was normal. This brake assembly was maintaining the desired amount of pressure on application 9f force. (App. npⁿ).

15.3. The Engineers at M/S. P.I.A.c. Test Lab.also established during their tests conducted on the right hand gear assembly that there were no signs of pre-accident metal failure on the right hand main gear assembly. All the broken parts showed that they had failed under over-load condition, applied to this gear (App. non).

15.4. The brake cylinder attached to the brake pedal was tested by Mr. M.I.Khan under the supervision of Mr. Noor Nabi. They found the operation to be satisfactory.

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16. OBSERVATION

16.1. There are a minimum of four daily movements of F-27 aircraft at Pasni. These aircraft operate to total capacity. In addition there are movements of small aircraft. It therefore makes a minimum passanger movements of 150 persons per day. It was noted that there were no fire fighting facilities at this airport. It is opinion that in event of aircraft fire, occupants lives will be gravely endangered.

16.2. Scrutiny of the perso_nal file No. FI/58-90/81 maintained by the Flight Inspection Directorate in respect of Mr. Syed Asif Saeed brought the following facts to light;

16.2.1. Mr.Syed Asif Saeed was permitted to sit for examination in technical subjects for issue of professional flying licences without waiting for receipt of N.O.C.from the A.H.Q. 1/fi'Syed Asif Saeed applied for sitting in the ALTP/I.R./F.I. rating examination. In support of his claim he submitted supporting documents including a certificate issued by the Base Commander, P.AF Base,Masroor stating that he may appear in any civil examination to improve his qualification in accordance with rules and regulations governing the examinations. This request was considered by the Flight Inspection Directorate and it was decided that A.H.Q.,be approached to verify the qualifications and experience and advise if he was permitted to appear in the examination. A request was sent to A.H.Q.on 3rd June, 1981. (App. "W").

16.2.2. The N.o.c. was issued by the A.H.Q. on the 16th June,1982, one year and thirteen days af.ter the request was made (App. "X"). Most of the formalities except flight checks had been completed before the receipt of this N.o.c.

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16.2.3. There is a requirement under the rules that a Pilot for issue of rating has to undergo night flying test. (App. "S1-2 . No record is available to show whether such a test was carried out.

16.2.4. The total flying time involved on each type of aircraft which were used flight check are given as under:-

a) PIPER AZTEC (Multi-engine)

i. Type rating
ii. Instrument
iii. Flight Instructor Rating.

) Total time the aircraft has been in air for this sorty - 1 :00 Hour

b) CESSNA-150

i. Type Rating
ii. Flight Instructor Rating.

) Total time the aircrafi has been in the air fol this sorty-1 :00 hour.

c) CESSNA-206

i. Type Rating
ii. Flight Instructor

) Total time the aircraft has.been in the air fm this sorty - 0 :45 Nfin

16.2.5. Considering the laid down syllabus (CA 102 and CA 124 App. "2"),it is opinion of the investigators that each check for issue of type rating will consume at least one hour. Comparing the above calculations with the actual time recorded it ap ears that the tests were conducted in too short a period. It is pointed out that the Instrument Rating check may be combined with type rating check because both the checks are carried out when the Pilot under check occupies the left hand seat. However,for a Flight Instructor/Assistant Flight Instructor Rating check the Pilot under check occupies the right hand seat.

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16.2.6. On 9th July,1981 exemptions in all subjects except (i) communication procedure (ii) aircraft loading weight and balance part of flight planning for issue of F.O.O. Licence were granted to Mr. Syed Asif Saeed (App. "W"). Such exemptions is entitlement of the holder of an *ALTP* Licence. l\1r.Syed Asif Saeed was not a holder of any civil licence till one year after the above mentioned exemptions were granted. He was also permitted to sit for examination for the issue of the F.O.O. Licence.

16.2.7. The CA 436 does not provide a column to record the date of issue of a licence. In this case difficulty was experienced to find out this date. A column needs to be introduced to show the above mentioned date.

16.2.8. Mr.Syed Asif Saeed had only 75 hours flying experience on tail wheel aircraft. He flew this sorty after a lapse of 21 days.

1-7. INVESTIGATIONS

17.1. The investigators alongwith Mr.Syed Asif Saeed, the Pilot..:in-Command of this aircraft, f-'Mushahid the Chief Pi.lot M/S. Khan Aviation and Mr. M.I.Khan Aircraft Engineer holding Cessna-185 rating on his Licence No. 247 arrived Pasni Airport at 1500 hours local time on the 9th October,1982. Initial examination of the wreckage, which was guarded by police, was carried out.

17.2. The investigation team after carrying out the initial examination of the wreckage proceeded to the threshold of runway 24, the direction which was used for take-off by Mr.Syed Asif Saeed. That portion of the runway, which was used for take-off, was scanned for broken parts and tyre marks. Site diagram was prepared (App. "V"),photographs were taken and only those considered necessary form part of this report. (App. "U")

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17.3. One screw and one bolt, which were picked-up from the runway, did not belong to the aircraft under investigation. These in addition to not being used by Cessna-185F, were found corroded which indicated that these had not been in use for a considerable length of-time.

17.4. No tyre marks were observed on the asphalt portion of the runway. It therefore indicated that during the initial part of the take-off roll there was no abnormality. It was due to the fact that the load was shared by all the three wheels during this phase of take-off.

17.5. The tyre marks on the bituman portion indicated that the aircraft had developed a right swing. (App. [illegible]). These marks showed that the aircraft was proceeding away from the centre line towards the right edge of the runway till it reached its maximum distance of 62 feet from the centre line to the right. The right hand tyre marks were observed much more prominent throughout the distance covered during th take-off roll (App. [illegible]).

17.6. The tyre marks after reaching a distance of 62 feet from the centre-line showed a sharp left turn on the runway till the right wheel broke on the runway surface. It was observed that the track had also reduced. The right hand landing gear spring wedged into the runway surface five feet short of left hand runway edge (App. [illegible]). The aircraft continued to swing left till it came to rest 100 feet away from the runway edge in the kacha. Before the aircraft came to rest, the right hand landing gear spring separated from the aircraft at a distance of 50 feet from the left edge of the runway.

17.7. Key of the aircraft was handed over to f"Ir.Syed Asif Saeed. He opened the Pilot entry door and examined the cargo. He confirmed that the cargo consisting of nine gunny bags (App. "U-1 O'}was the same load he had loaded in the aircraft and had left in the aircraft after the accident.

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17.8. This cargo consisting of nine water soaked gunny bags containing prawns were off-loaded in the presence of Mr.Syed Asif Saeed, Mr.Mushahid, Mr. M.I.Khan and Mr.Shahabuddin. After off-loading, the cargo was weighed on M/S. P.I.A.C. weighing scale available at Pasni Airport. The total weight came to 501 Kgs or 1102.5 Lbs. (App. "D-1"). This aircraft was over weight by a minimum of 238.5 Lbs as worked out by Mr.Syed Asif Saeed, Pilot of this aircraft (App. "D").

18. 'WITNESSES

18.1. The following statements were recorded:-

18.1.1. Statement of Pilot, Mr. Syed Asif Saeed plus questions & Answers. (App. "B&C").

18.1.2. Pay load calculations for this flight made by the Pilot. (App. "D").

18.1.3. Statement of rJJr.Javed Khan of M/S. Khan Aviation and question answers (App. "F").

18.1.4. Statement of rJJr. M.I.Khan, Aircraft Engineer (App. "G").

18.1.5. Statement of passenger on board this flight and question answers. (App. "N").

18.1.6. Statement of Mr.Rajput, Flight Instructor who carried out flight checks for issue of licence and question answers. (App. "K&L")

18.1.7. Statement of Mr.Tahir Kazmi, Aircraft Engineer employed by M/S. Khan Aviation. (App. "M").

18.1.8. Repo-rts on serviceability status with regard to landing gear and brake s¥stem received from M/S. P.I.A.C. (App. "0 & p[t).

19. DISCUSSION

19.1. The tail wheel aircraft have a tendency to swing on take-off. The direction of swing depends upon the direction of rotation of the propeller. When viewed from the cockpit, an aircraft will swing to the left if rotation of the propeller is in the clockwise direction.

19.2. The cause for the swing mentioned in the preceding paragraph are due to:-

19.2.1. TO QUE EFFECT: As a reaction to the fast moving propeller,the fuselage will tend to rotate in the opposite direction to the rotation of the propeller movemerit,thus placing more weight on left wheel in this case.

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19.2.2. GYROSCOPIC EFFECT: Any force applied to a gyro acts at ninety degrees to the point where the force is applied. In case of a propeller rotating in a clockwise direction, as viewed from the cockpit, when the tail of the aircraft is raised, force is applied to the top of the propeller. This force acts at 90° to the direction of rotation of the popeller. This forces the aircraft to swing to the left.

19.2.3. SLIP STREAM EFFECT: The slip stream produced by the propeller is in a spiral pattern. It hits the fin and the rudder from the left side, in case of a propeller rotating in clockwise direction,thus forcing the aircraft to the left.

19.3. This Cessna-185F, AP-BBC was overloaded by more than 238.5 Lbs of its payload. (App. "n"). This overload works out to be 27.62% of paylo d. In the circum stances of this over loaded aircraft the centre of gravity would shift towards the rear. During taxiing and take-off roll, till such time the tail wheel was on the ground,all the three wheels were sharing the load.

19.4. When the tail wheel was raised, the load was shifted on to main wheels. Although in accordance with what has been stated at para 19.2.1., 19.2.2. and 19.2.3. above, the aircraft should have initiated a swing to the left. Contrary to this the aircraft initiated a right swing. This is possible only in case of uneven distribution of the load or over correction. It is opinion of the Investigators that there was more load on the right side of the cabin and consequently more load on the right gear. This is confirmed by the fact that right tyre has left dark marks on the runway surface (App. "U-5 i). The left hand gear tyre marks. are so light that these are not even visible in the photograph (App. "U-5 ii).

19.5. Once the aircraft developed a right swing on the runway, coupled with increased speed, the right hand main landing gear was subjected to loads much higher than it is designed for. This is where the gear started failing under og:r load. ':L'hiscoincides with the Pilot's statement thatLheard a cracking noise from t.he right hand gear at about this stage. (App. "B-2").

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19.6. On hearing the noise mentioned in the preceding para, the Pilot decided to abort take-off. Since the aircraft had developed a swing to the right,the only course of action left for the Pilot was to use left brake and rudder. It is an opinion that the Pilot made an over correction. This action on the part of the Pilot resulted in left gear acting more or less like a pivot,now c-auaing the aircraft to swing to the left.

19.7. In this situation the right gear had to face two force components. One trying to turn the aircraft to the left and the second force trying to push the aircraft wheel in the direction of the movement of aircraft. This caused the right hand gear to fail under heavy load conditions. (App. "O").

19.8. The aircraft being under the state of an uncontrollable swing followed its direction of movement till it came to rest 100 feet away from the South Eastern edge of the runway. The right hand main gear wheel assembly was damaged serverely and separated from the aircraft before it left the runway (App. "U-6"). Afterwards the right hand landing gear spring itself separated from the fuselage.

19.9. A notice was served on Mr.Syed Asif Saeed as provided under Rule 331 of Civil Aviation R.ules,78 (App. nQn). Explanation dated 13th December,1982 submitted by Mr. Syed.Asif Saeed (App. "R") do not result in any change in the findings.

20. FINDINGS.

20.1. The Pilot had a valid ALTP and Comm·ercial Licence with Cessna-185F endorsed on it although irregularities **were** observed in issuance of these licences.

20.2. The aircraft had a valid C of A.

20.3. The aircraft had a valid C of R.

20.4. The aircraft was properly maintained and certified to be airworthy.

20.5. The aircraft had a valid Co M.

20.6. No defects were entered or pointed out by the Piiot at Pasni Airport in the journey log book before his departure.

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20.7. The Pilot did not log the oil and fuel quantity on arrival and at the time of departure at Pasni.

20.a. The aircraft was overloaded by a minimum of 238.5 Lbs which works out to be 27.62% of the pay load resulting in movement of C of G towards the aft of the aircraft.

20.9. The cargo was not secured in the aircraft cabin. No lashing equipment was seen in the aircraft.

20.10. The cargo had flexed to the right side of the cabin.

20.11. Although the Pilot also holds Flight Operation Officer's Licence, it appears that he was not aware of the conseouences arising out of overloading and uneven distribution of load.

20.12. There is no requirement for the general aviation aircraft to maintain record of trimsheet.

20.13. Pilot has limited experience on tail wheel aircraft.

20.14. Pilot has not undergone night flight check which is a requirement under the rules for issue of CPL and ALTP.

20.15. The duration of flight checks for issue of licences and ratings is on the low side, and should have been at least double the period in accordance with C.A.102 and c.A.124.

20.16. Irregularities were observed in issuance of professional flying licences in that no night flying check was conducted and the checks specified in CA 102 and *CA* 124 were not followed.

20.17. Exemptions were granted to Mr.Syed Asif Saeed in respect of Flight Operations Officer's Licence when he was not entitled for any exemptions.

21. CAUSE

21.1. The right gear failed under overload when it was subjected to loads beyond its design capabilities due to careless and negligent operation in that the Pilot failed to correctly load the aircraft prior to take-off.

22. RECOI 1ENDATIONS

22.1. Consideration may be given to take action against the Pilot under the rules for his failure to follow procedures for lo ding the aircraft.

22.2. The operator be advised to ensure that operating procedures are issued in writing.

22.3. Suitable action be taken to ensure that discrepencies on procedures for issue of. licences is corrected.

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22.4. Consideration may be given to provision of fire-fighting facilities at all airports/airfields where public transport aircraft operate.

22.5. Proper authorization in writing for carrying out pre-flight checks by the Pilot of the General Aviation is to be ensured in future.

App. 'U'

A view of the wreckage of Cessna 185F. Nationality and Registration Mark AP-BBC can be seen clearly. Please also note propeller. The tip of the upper blades has broken-off.

'U-2'

A view of the wreckage from left hand side. Please note port wheel and tail wheel are in tact. In the fore ground the damaged starboard tyre and wheel broken-off can be seen. The starboard landing gear spring and axle can be seen just below the aircraft fuselage.

"3"

A front view of the wreckage. Note port wheel and landing gear spring and damage to the starboard wing.

"4"

Rear view of the wreckage. Please note tail wheel and damage to starboard tail plane and elevator. Also note position of flaps which are set for take-off.

"U-5"

5

View of the runway taken from the take-off direction. Please note tyre marks on the bituman to the right of the centre line. The extra dark spots are the stones placed by the investigators.

"U-6"

6

View of the tyre marks on the runway left of the centre line as the aircraft left the runway. Note starboard tyre marks indicating final failure of the starboard wheel at this point.

U-7

View of the last point of the starboard wheel track at which point the wheel had broken-off.

U-8

View of pieces of the rim of the starboard wheel on the runway close to the tyre tracks shown on exhibit U-6.

"U-9"

9 The tip of the propeller blade which had separated after the impact with the soft ground after the aircraft left the runway. No marks of propeller were evident on the runway surface.

"U-10"

10 View of the Cargo removed from the aircraft on the 9th October,1982. The Cargo of prawns were packed in gunny bags which were found to be soaked at the time of removal. The ground below the aircraft belly was also wet.