

ORIGINAL

NO.HQCAA/1901/210/SIB



CIVIL AVIATION AUTHORITY

**AIRCRAFT INCIDENT INVESTIGATION M/S PIAC
AIRBUS - 300 REG.NO.AP-BBM WHICH OCCURRED**

ON 16TH AUGUST, 1996

AT

QUAID-E-AZAM INTL AIRPORT

KARACHI



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KARACHI, PAKISTAN

AIRCRAFT INCIDENT INVESTIGATION

INVESTIGATION IN RESPECT OF INCIDENT TO
M/S PIAC AIRBUS REG NO. AP-BBM OCCURRED ON
16TH AUGUST, 1996 AT KARACHI AIRPORT.

Authority:- Director General Civil Aviation Authority
Memorandum No. HQ CAA/1901/210/SIB dated
24th August , 1996

Composition Of Investigation Team

- | | | |
|-----|--|-----------------------|
| (a) | Air Cdre(Retd) Ilyas Majid
Chief Of Airworthiness CAA | Investigator Incharge |
| (b) | Wg Cdr (Rtd) Sajjad Ahmed
Technical Investigator, SIB CAA | Senior Investigator |
| (b) | Engr Atta-Ur-Rehman
Senior Airworthiness Surveyor CAA | Investigator |

1. AIRCRAFT INFORMATION

- | | | |
|------|--|---|
| 1.1. | Aircraft type | : A-300 |
| 1.2. | Reg. NO. | : AP-BBM |
| 1.3. | Engine types, airframe
positions & S.Nos. | : CF6-50C2, POSN. 1 - 455339
POSN. 2 - 528-154 |
| 1.4 | Certificate of Registration | : No. 561 |

- 1.5 Certificate of : 064/04-08-1997
Airworthiness No. & date : CAA-462 (Rev-1)
of expiry, and flight
manual No.
- 1.6 Certificate of Safety date : C of M 25.03.1996
& time (GMT) of issue and
period of validity.
- 1.7 Date of construction of : February, 1979
airframe.
- 1.8 Name address of Owner. : M/S PIAC Karachi
- 1.9 Airframe history. (Give : On 15.08.1996. T.S.N. - 43706-
flying times since 29
manufacture, last Last check B done at 42556-38
overhaul and last periodic T-hrs/25.03.96.
check. List also essential Last Base check at 34341-00
modifications completed. T-Hrs/13.01.1993
- 1.10 Engine history. (Give : No.1 S.No.455-339 TSN-44744-
flying time since /CSN-17899
manufacture, last No.2 S.No.528-154 TSN-25045-
overhaul and last periodic 13/CSN-11120.
check. List also essential
modifications completed).

2. CREW INFORMATION

- 2.1 Not required.

3. SUMMARY

- 3.1. On 16th August, 1996 a bird hit incident occurred on
M/s PIAC Airbus Reg No. AP-BBM while operating PK-465
from Lahore to Karachi. During layover checks the
engineering staff after observing evidence of blood stains on
/the

the acoustic panel and outer ends of fan blades of No.1 engine decided to inspect it thoroughly. Subsequently, during detailed inspection by senior engineers evidence of piece of flesh about one inch in size between 10 and 11 O'clock position at the fan outlet guide vanes and few feathers at the outer end of outlet guide vanes were observed. Seeing the condition of the engine the senior engineering staff on duty was of the view that prior to release of subject engine for further operation its Boroscopic inspection should be carried out. Whereas, Director of Engineering and Maint felt no necessity of BSI under the circumstances and threatened the senior engineers of dire consequences if a BSI on subject engine was carried out. Later on, same aircraft while operating PK-312 at about 1300 hrs on the same day returned to bay from take off point under instructions from CAA officials. Subsequently, BSI of No.1 engine as required by CAA was carried out in which five first stage HP compressor blades were found damaged out of which one blade had evidence of material tear which is not permissible by the Maint Manual. Therefore, No.1 engine was removed.

4. INJURY TO PERSONS

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

5. DAMAGE TO AIRCRAFT

- 5.1. Fan blades were found damaged beyond Maint Manual Limits.

6. OTHER DAMAGES

6.1. None

7. METEOROLOGICAL CONDITION

7.1. The weather was fair and visibility was good.

8. NAVIGATIONAL & LANDING AIDS

8.1. Not relevant.

9. COMMUNICATIONS

9.1. Not relevant.

10. AERODROME AND GROUND FACILITIES

10.1. Not relevant.

11. FLIGHT RECORDERS

11.1. Not relevant.

12. WRECKAGE & IMPACT INFORMATION

12.1. Not relevant.

/Fire

13. **FIRE**

13.1. No smoke or fire was caused due to the incident.

14. **SURVIVAL ASPECTS**

14.1. All passengers and crews disembarked using the normal exits

15. **TEST & RESEARCH**

15.1. Nil

16. **OBSERVATIONS**

16.1. Evidence of bird ingestion was observed in the engine after strip examination of the engine by the Board(Ref Appendix B1 to B16).

16.2. A threatening atmosphere prevails at M/S PIAC where even senior engineers are reluctant to point out serious aircraft discrepancies using their professional ingenuity. An incident on Boeing-747 Reg. No. AP-BCN occurred on 13th April, 1996 in which its NO.1 engine scrubbed the ground while landing at Jeddah was not reported by AMEs at Jeddah and Lahore and subject incident are examples.

17. **WITNESSES**

17.1 Statement of witnesses are given in Exhibits 'H2' to 'H6' to this report.

/investigation

INVESTIGATION

18. On 16th August, 1996 M/s PIAC AME Munir Khan during lay over checks observed evidence of bird hit on No.1 engine of Airbus Reg No. AP-BBM which had operated PK-465 from Lahore to Karachi. Subsequently, at about 0900 hrs Engr. Munir Khan along with Engr. Yousuf Incharge Shift 'A' of Line Maint.-II inspected No.1 engine and observed the following:-

18.1. Blood stains on the intake acoustic panel located in front of the fan blades.

18.2. Blood stains on the outer end of fan blades.

18.3. Piece of flesh of about one inch size in between 10 and 11 O'clock position at the fan outlet guide vanes at its outer end.

18.4. Few bird feathers at the outer end of outlet guide vanes. (Ref Appendix B11 to this report)

19. After inspecting No.1 engine Engr Yousaf and Engr.Munir went through the log book and observed that no entry regarding change in No.1 engine performance was reported by the air crew. However, seeing the condition of the engine they decided that Boroscopic inspection of subject engine should be carried out prior to its release for further operations as stipulated in the Airbus Fault Isolation Manual Chapter 72-00-00 Page 133 the details of which are given in Appendix 'G' to this report. Same aircraft was scheduled to operate Pk-312 at about 1230 hrs. As such, Engr. Yousaf shift Incharge shift 'A' proceeded to make necessary arrangements for BSI. At about 10:00 hrs Engr. Shafi-Uz-Zaman Director Engg & Maint came to the office of Line Maint-II where he was briefed by Engr. Munir about the condition of No.1

/engine

engine of Airbus Reg No. AP-BBM and that BSI of subject engine would be required. At this stage Engr. Zaman along with Engr. Munir went to subject aircraft and inspected its No.1 engine. After inspecting No.1 engine Engr. Zaman having observed only a two square inch blood mark on the right hand top of the inlet cowl near the fan blade tip and no other damage was of the view that no BSI of the engine was required. Subsequently, Engr. Zaman went away to the Duty Engineer Room. Later on Engr. Munir informed Engr Yousaf about the views of Engr. Zaman; however, by that time Engr. Yousaf had already made arrangements for BSI and Engr. Rais Ahmed Khan (BSI specialist) and Engr. Moin(Manager QC) from PPOH Shop had already arrived on the aircraft and the cowlings of No.1 engine were opened for BSI . While Engr. Rais and Engr. Moin were busy inspecting No.1 engine visually Engr. Zaman also came on the aircraft at about 1100 hrs and was informed by Engr Rais that the fan blades condition was satisfactory; however, due to other evidence like blood stains, presence of feathers in the intake a BSI would be required to determine internal damage to compressor blades. At this juncture Engr. Shafi-uz-Zaman using abusive language shouted at Engr Rais Ahmed and told him that if he(Rais) would carry out BSI of subject engine he (Zaman) would cancel his approval within a minute which he repeated three times in presence of Engr. Yousuf, Engr. Munir Khan and Engr. Moin. Subsequently, as ordered by Engr. Zaman, Engr Munir closed the engine cowling panels and released the aircraft to operate its scheduled flight at about 1200 hrs after making an entry in the technical log that No.1 engine was visually inspected for bird hit.

20. At about 1230 hrs Airbus Reg No. AP-BBM while operating PK-312 taxied out when Senior Airworthiness Surveyor Engr. Atta-Ur-Rehman received an anonymous call informing him that No.1 engine of subject aircraft which had evidence of bird hit had been cleared for operation without accomplishing BSI, contrary to the requirements of Maint Manual. On receiving the message Engr. Atta contacted Engr. Yousaf who informed him that / although

although Engr. Rais was called to carry out BSI of No.1 engine but Engr. Zaman did not permit BSI on subject engine and aircraft was released for operation under Engr. Zaman's instructions.

Engr. Atta-ur-Rehman directed Engr. Yousaf to withdraw Engr. Munir from duty who had released the aircraft for operation and that he (Munir) should report to the Controller Airworthiness (S) next day. Thereafter, Engr. Atta again received an anonymous information on telephone that aircraft Reg No. AP-BBM was still at the holding point. Soon after Engr. Atta contacted the ATC controller who informed that Engr Yousaf had requested ATC tower to call the aircraft back for maintenance as required by CAA .

21. After return of subject aircraft back to bay, Engr Rais Ahmed accomplished BSI of No.1 engine and at about 1430 hrs Engr Atta was informed by Engr Yousaf that BSI of subject engine had been carried out in which a total of five blades have been found damaged with metal chipped off from leading edges. Out of these one blade of the compressor had evidence of tear beyond limits stipulated in Chapter 72-31-00 page 201 & 202 of Maintenance Manual and an entry to that effect was made in the technical log by Engr. Rais.(Ref Appendices B, to B8, B17, E & F). Subsequently, in reply to Engr. Atta as to why BSI of subject engine was not carried out earlier Engr. Rais informed him that he was threatened by Engr. Zaman Director E&M that if he carried out BSI of subject engine his (Rais) certification authority would be withdrawn immediately. Engr. Rais further informed Engr. Atta that he was still afraid of action that Engr. Zaman might take in retaliation.
22. On 17th August, 1996 No. 1 engine was inspected by Mr. Clarence Clem Dye GE Rep at M/S PIAC who in consultation with the GE compressor specialist at Cincinnati USA informed M/S PIAC vide letter No. Nil dated 18th August, 1996 (Ref. Appendix 'D') that in view of zero stock of standby engine at M/s PIAC, no CF6-50-C2 engine entering test for next five to seven /days

days, the severity of damage and to avoid added expenses and delays to M/S PIAC operations subject engine was released to operate for 50 cycles with the condition of accomplishing BSI initially and after 25 cycles operation. However, it was categorically mentioned in referred GE letter that no sooner a spare engine was available the letter was to be considered null and void. Later, in his statement before the Board Mr. Clem Dye stated that subject engine operation could have continued operation even after 50 cycles if no increase in the distress was observed in the affected blade that was found damaged beyond limits during BSI initially prior to engine removal.

ANALYSIS

Boroscopic Inspection Necessity

23. According to the statements of Engr. Munir Khan AME No. 476 (Engr. on duty), Engr. Muhammad Yousaf AME NO. 405 (Incharge Line Maint-II), Engr. Rais Khan Approval No. 282 (BSI Specialist) and Engr. Syed Noor-ul-Moin Approval No. 612(QC Manager), after accomplishing visual inspection of No.1 engine of Airbus Reg No. AP-BBM that had operated PK-465 from Lahore to Karachi, had observed the following evidence of bird hit on subject engine :-

- 23.1. Blood stain marks on the intake acoustic panel located in front of the fan blade.
- 23.2. Blood stain marks on the outer end of fan blades.
- 23.3. A piece of flesh about one inch in size stuck on the fan outlet guide vanes at its outer end between 10 and 11 O'clock position

24. According to the statement of Engr. Zaman Director of Engg & Maint M/S PIAC he along with Engr. Munir had only observed a 2 Sq inch blood mark on right hand top of the inlet cowl near the fan blade tip and that was the only evidence of bird ingestion that they had observed. Whereas, Engr Munir in his statement had brought out the evidence of bird hit given in paras 23.1, 23.2 and 23.3 above. Additionally, Engr. Munir had stated that Engr. Yousaf inspected subject engine and on his advise they at that stage decided to carry out BSI of subject engine. Furthermore, Engr. Yousaf has stated that in view of the evidence of bird hit he was convinced that BSI was essentially required in accordance with Fault Isolation Manual Chapter 72-00-00 page 133 (Ref Appendix 'G') and he had also briefed Engr. Zaman about the requirement of BSI under the circumstances.
25. Engr. Rais in his statement stated that after visual inspection he was convinced that BSI of subject engine was required to establish internal condition of the engine and these views he also expressed before Engr. Zaman on his arrival on the aircraft at about 1100 hrs.
26. From the foregoing evidence the Board is certain that the evidence of bird hit observed by senior engineers having more than 30 years of the experience in handling maintenance of aircraft rightly felt the necessity of BSI on No.1 engine prior to its release for further operation and this action was justified in accordance to stipulated procedure given Airbus Fault Isolation Manual Chapter 72-00-00 Page-133 the details of which are given in Appendix 'G' to this report.

Abusive And Threatening Language

27. It has been stated by Engr Yousaf Incharge Shift 'A' line Maint-II /that

that he was convinced after visual inspection of No.1 engine that BSI was essentially required, had requested PPOH Shop for BSI and had briefed Engr. S.U. Zaman Director E&M in the Line Maint-II office that BSI of subject engine was required. However, later when he was told by Engr. Zaman that there was no need of BSI and had threatened to withdraw approval of Engr Rais, Engr. Yousaf did not say anything and kept quiet. In reply to a question on the subject Engr. Yousaf informed the Board that he perhaps kept quiet due to authoritative, insulting and derogatory Management style of Engr. S.U. Zaman and was not satisfied with the administrative and safety culture prevailing at M/s PIAC.

28. Engr. Yousaf, Engr. Munir, Engr Moin and Engr Rais had all stated in their statements that Engr. Zaman while talking to Engr. Rais near the aircraft shouted and said that he would see who bastard will carry out BSI on No.1 engine and threatened Engr. Rais that his approval would be withdrawn within a minute if he tried to accomplish BSI on No.1. engine
29. Engr. Zaman in his statement confessed that he had told Engr. Munir that his approval would be withdrawn which is not validated from the statement of Engr Munir. Additionally, in reply to a question Engr. Zaman denied having used abusive and threatening language against Engr. Rais.
30. Engr. Rais in his statement informed the Board that he had asked Engr. Yousaf to convey in writing when request for BSI was initiated after subject aircraft had returned to bay from holding point. This fact is also substantiated by the statement of Engr. Yousaf that he gave in writing to Engr. Rais that BSI of No.1 engine was to be accomplished because Engr. Rais had insisted for a written request as he had earlier been threatened by Engr. Zaman that his approval would be cancelled if he carried out BSI of subject engine.

/31.

31. In view of the evidence brought out in the foregoing paragraphs the Board is of the opinion that derogatory and threatening language was used by Engr. S.U. Zaman against Engr. Rais Ahmed Khan.

Engine Removal Justification

32. After accomplishing BSI on No.1 engine Engr Rais Khan observed damage on five first stage compressor blades out of which one blade had evidence of material tear at the tip of the leading edge by about 3/4 inch which is not permissible in accordance to Page 202 Chapter 72-31-00 of Airbus Maintenance Manual(Ref App 'F'). Hence Engr. Rais entered subject discrepancy in the log book and No.1 engine SNo. 455339 was removed.
33. The Board after examining the evidence of damage on blade marked No. 5(Ref App B1&B2) and the limits given in Airbus Maintenance Manual Page 202, Chapter 72-31-00 is of the view that engine removal under the circumstances was justified and Engr. Rais Khan along with Engr. Yousaf adopted right course of action.

GE's Contradictory Opinion

34. Engr. S.U. Zaman in his statement stated that on 17th August, 1996 under his advise subject engine was Boroscopically examined by Chief Engr. PPOH Shop, GE Rep and Manager Engineering PPOH Shop at Karachi, who after inspection issued jointly a certificate (Ref Appendix 'C') and its contents were conveyed to GE USA. However, on review of the certificate it was observed by the Board that subject certificate was addressed to GE Rep at Karachi and was not signed by GE Rep as stated by Engr. Zaman in his statement while referring to subject certificate. Mr. Clem Dye GE
/Rep

Rep at M/s PIAC Karachi stated that after inspecting damaged blades of subject engine and in response to the letter which was addressed to him by M/s PIAC he after consulting GE USA issued letter dated 18th August, 1996 (Ref Appendix 'D'). In the referred letter GE Rep cleared subject engine for 50 cycle operation on wing and informed that this decision was based keeping into account zero ready spares, no CF6-50C2 engine entering test for next five to seven days, severity of damage and its location and to avoid expenses and delays to M/s PIAC. However, GE Rep categorically stated in the referred letter that contents of subject letter should be considered null and void once a ready spare engine is available. Additionally, it was stated in the referred letter that prior to operation engine damage was to be inspected Boroscopically and results of BSI were to be documented and thereafter engine was to be Boroscoped at 25 cycle intervals and engine was not to exceed 50 cycles on the wing. However, Mr. Clem Dye in his statement stated that after physically examining the blade that was damaged beyond limit he was of the view that subject engine could have continued further operation under Boroscopic inspection scan at 25 cycle intervals upto 50 cycles and if no propagation of crack/damage to the distressed blade was observed after 50 cycles of operation the engine could have continued further operation on wing.

35. The Board after going through the evidence found that the contents of the statement of Mr. C. Dye recorded before the Board and the GE letter on the subject addressed to M/s PIAC and signed by him (Dye) had following contradictions :-

- 35.1. In the referred letter GE Rep cleared the engine for 50 cycle operation only keeping into account zero ready spares, no CF6-50 C2 engine entering test for next 5 to 7 days, the severity of damage and its location and to avoid added

/expenses

expenses/delays to M/s PIAC and subject engine was to be removed from wing on availability of spare engine. Whereas, in his statement Mr. Dye had stated that subject engine could have continued operation even after operating 50 cycles if no increase in distress was observed in the affected blade that was damaged beyond limits. (Ref Appendix H5)

36. The Board after examining the distressed blade that was damaged beyond limit was of the opinion that subject blade was damaged beyond limit in accordance to Page 202 Chapter 72-31-00 of Airbus Maintenance Manual. (Ref Appendix 'F'). As such, the action taken by Engr. Rais Ahmed Khan by logging an entry to that affect was correct and subject engine was rightly removed from the wing. Additionally, the Board observed that Mr. Dye had two opinions on the subject of release of engine for further operation with the stressed blade that was damaged beyond limit and both these opinions he gave after examining the blades physically. Therefore, under the circumstances it appears to the Board that Mr. Dye was not sure of his opinion on the subject which is in gross violation of the limitations given by the company in the Maintenance Manual and the matter needs to be resolved by physically sending the affected blades to GE USA.

Industrial Dispute.

37. Engr. S.U. Zaman in his statement informed the Board that the controversy between him and senior engineers on subject issue should be viewed in the context of an industrial dispute between Society of Aircraft Engineers in Pakistan and Management of M/s PIAC regarding agreement between the two parties on the subject of pay & allowances. The Board on review of the evidence found the following :-

/37.1.

- 37.1. No.1 engine had ample evidence of Bird hit and going for a BSI to determine extent of internal damage to the engine was a Logically and technically correct course of action that was determined by senior, experienced and qualified engineers all of them having more than 30 years experience in the field of aircraft maintenance.
- 37.2. Engr. Zaman had stated that while inspecting subject engine he had observed a blood stain mark of about 2 Sq inch on right hand top of the inlet cowl near the fan blade tip and that was the only sign of bird ingestion that he had observed. Whereas, the engine had other evidence of bird ingestion also like feathers, piece of flesh and blood stain marks on the intake acoustic panel located in front of the fan blade. Additionally, Engr. Munir and Engr. Yousaf had already briefed Engr. Zaman about the evidence observed and the necessity for a BSI to determine internal condition of the engine.
38. In view of the evidence discussed above the Board is of the opinion that the controversy between Engr. Zaman Director E&M and other senior engineers arose because Engr. S.U. Zaman did not inspect the engine thoroughly and he thought that it was a minor case of bird hit; whereas, he was wrong in his assessment and incorrectly gave his verdict that BSI should not be carried out which was technically required. The Board found that it was a difference of opinion on a purely technical matter which often arise in the process of aircraft operation. Engr. Zaman is himself a licensed engineer and could have asked the senior engineer to make an entry regarding requirement of BSI and could have cleared the same to release the aircraft for further operation. Should such a course of action was adopted the situation leading to subject inquiry could have been averted. Additionally, the Board observed that Airbus Reg No. AP-BEL was available that could have been detailed in place of Airbus Reg No. AP-BBM. Moreover,

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the aircraft Reg No. AP-BBM was scheduled to operate PK-312 at about 1230 hours and BSI staff had come on the aircraft at about 1100 hrs and could have completed BSI much before scheduled departure of the aircraft .

39. The Board observed that the controversy between Engr. Zaman and other Senior Engineers was not an industrial dispute but it stemmed from mishandling of controversy which was purely technical in nature and not from prevailing relations between Management and Society of Aircraft Engineers on the issue of wages etc. If the situation was tense then a senior manager should have been more careful in resolving conflict instead of adopting a coercive, derogatory and crude management style which eventually not only resulted in economical loss but also affected the credibility of M/s PIAC at large. X

CONCLUSION

40. On 17th August, 1996 evidence of bird hit on No.1 engine of Airbus Reg No.AP-BBM was observed during lay over checks and Engr. Yousuf Incharge line Maint-II asked PPOH Shop to despatch BSI specialists on the aircraft. Meanwhile, Engr. Zaman Director Engg & Maint also came on the aircraft and after discussion with Engr. Munir felt no necessity of BSI on subject engine. Later on Engr. Rais & Engr. Moin came on the aircraft. While they were inspecting the engine visually, Engr. Zaman also came on the aircraft and shoutingly used abusive language and threatened Engr. Rais that he would withdraw his (Rais) approval if he (Rais) carried out BSI on subject engine.
41. Subsequently, under Engr. Zaman's orders the aircraft was released to operate PK-312 by Engr. Munir. However, the aircraft returned to bay under CAA's instructions when the matter was anonymously communicated to Engr. Atta-Ur-Rehman of CAA. Thereafter, Engr. Rais carried out BSI of subject engine in which a

/total

total of 5 HP Compressor blades were found damaged. Out of these blades one blade was damaged beyond the limits prescribed in the Airbus Maint Manual. As such, No.1 engine was removed.

42. In reply to the queries raised on subject engine GE informed M/s PIAC that the engine could operate for 50 cycles under Boroscopic scan at 25 cycles interval. However, GE categorically stated that the engine operation is to be discontinued no sooner a spare CF6-50-C2 engine was available.
43. Later Mr. Clem Dye contradicted contents of referred GE letter and opined that decision of M/s PIAC senior engineers to remove subject engine was incorrect and it could have continued operation beyond 50 cycles if no propagation in damage was observed on the distressed blade. The conflicting situation vis-à-vis the procedures given in the Maint Manual and opinion of GE Rep. Mr. Clarence Clem Dye needs to be resolved by sending damaged blades to GE USA.
44. The controversy between senior engineering staff and Engr. Zaman on the issue of BSI of No.1 engine was purely a technical matter and not an industrial dispute that could have been resolved by application of professional and managerial skill rather than crude, ruthless and derogatory managerial style which pragmatically complicated the problem.

FINDINGS

45. The Board finds that:-

- 45.1. On 16th August, 1996 M/s PIAC Airbus Reg No. AP- BBM while operating PK-465 from Lahore to Karachi had an incident of bird hit on No.1 engine and subject evidence was observed during layover check at about 0900 hours.
- 45.2. Engr. Munir Khan AME LIC No. 476 after having observed during layover checks some blood stain marks and few feathers inside air intake of No.1 engine informed Engr. Muhammad Yousaf AME LIC No. 405

/Incharge

Incharge Shift 'A' Line Maint-II about the condition of subject engine.

- 45.3. Airbus (300) Reg No. AP-BBM was scheduled to operate PK-312 at about 1230 hours.
- 45.4. Engr. Yousaf, along with Engr. Munir after inspecting No.1 engine decided to carry out BSI of No.1 engine prior to its release for further operation as required by Airbus Fault Isolation Manual Chapter 72-00-00 Page-133 and gave requirement for BSI to Power Plant Overhaul Shop.
- 45.5. At about 1000 hours Engr. Zaman Director E & M visited office of Line Maint-II where he was informed by Engr. Munir that No.1 engine of Airbus Reg No. AP- BBM had evidence of bird hit and that a BSI would be required.
- 45.6. At about 1015 hours Engr. Zaman along with Engr. Munir went to the aircraft and they both inspected No.1 engine. After having observed only a 2 inch blood stain mark on the right hand top of the inlet cowl near the fan blade tip as the only sign of blood ingestion Engr. Zaman told Engr. Munir that there was no requirement of BSI on subject engine.
- 45.7. Subsequently, in the Line Maint-II office Engr. Yousaf briefed Engr. Zaman that BSI of subject engine would be required; however, Engr. Zaman told him that in view of the condition of the engine no BSI was required.
- 45.8. At 1100 hours Engr. Rais Ahmed Khan Approval No.282 and Engr. Noor-ul-Moin Approval No. 612 came on Airbus Reg No. AP-BBM to carry out BSI of No.1 engine.
- 45.9. At about 1130 hours when Engr. Rais and Engr. Moin had inspected No.1 engine visually, Engr Zaman also came on the aircraft and asked Engr. Rais about the condition of subject engine. Engr. Rais informed Engr. Zaman that in view of the evidence of blood

/stains

stains, feathers and flesh on the outlet guide vanes a BSI would be required to determine internal condition of the engine. At this stage Engr. Zaman shouted at Engr. Rais and threatened him that if he proceeded with the BSI of the subject engine his (Rais) approval would be withdrawn within a minute and this he repeated twice.

45.10. Under the instruction of Engr. Zaman the cowling panels of No. 1 engine that were opened for BSI were closed and Engr. Munir released the aircraft to operate PK-312 after making an entry in the technical log regarding visual inspection of No. 1 engine that was carried out.

45.11 Despite the fact that Engr. Muhammad Yousaf was convinced that BSI of No. 1 engine was essentially required he kept quiet due to prevailing tense atmosphere.

45.12 At about 1230 hrs after the aircraft taxied out to operate PK-312 Engr. Atta-ur-Rehman Senior Airworthiness Surveyor received an anonymous call informing him that Airbus Reg No. AP-BBM which had evidence of bird ingestion in No. 1 engine had been released without carrying out maintenance as per the Maint Manual.

45.13 Engr. Atta on receipt of anonymous call contacted Engr. Yousaf who confirmed about the evidence of blood stains, feathers and flesh in the engine intake and that no BSI which was required as per Maint Manual had been carried out on subject aircraft. Additionally Engr. Yousaf informed Engr. Atta that despite the fact that he had called Engr. Rais for BSI but Engr. Zaman instructed Engr. Munir to release the aircraft without carrying out BSI .

45.14 Subsequently Engr. Atta on receipt of another anonymous call that Airbus Reg No. AP-BBM was still at QIAP contacted the ATC tower and the duty controller informed him that aircraft had been instructed to return to bay to meet the maintenance requirements of CAA.

/45.15.

- 45.15 After the aircraft had returned to Bay Engr. Yousaf again asked Engr. Rais to carryout BSI of No.1 engine. However, Engr. Rais refused to accept verbal request and asked Engr. Yousaf to give him in writing that a BSI of No.1 engine was to be carried out as earlier he (Rais) had been threatened by Engr. Zaman Director E & M that his (Rais) approval would be withdrawn if he carriedout BSI of subject engine. As such Engr. Yousaf gave in writing to Engr. Rais that BSI of No.1 engine was to be accomplished.
- 45.16 On receipt of BSI request in writing Engr. Rais carried out BSI of No.1 engine and observed a total of five stage one HP compressor blades that were damaged out of which one blade had evidence of tear/ deformation by about 3/8 inch at the leading edge tip which is not permissible as per the limits prescribed in Airbus Maint Manual Page-202/203 Chapter 72-31-00 and Engr. Rais made an entry to that affect in the technical log. (Ref Appendices B1 to B8, E, F and G).
- 45.17 On 17th August, 1996 No.1 Engine S.No. 455339 was removed from the aircraft and was stripped examined during which evidence of bird ingestion and five first stage HP compressor blades were found damaged out of which one blade was damaged beyond the limits stipulated in the Airbus Maint Manual. (Ref Appendices B9 to B16 and F).
- 45.18 On examining the extent of damage to the blades Mr. Clarence Clem Dye GE Rep at Karachi in consultation with GE Compressor Specialist at Cincinnati USA informed M/s PIAC vide letter No.nil dated 18th August, 1996 that in view of zero ready spares, no CF6-50-C2 engine entering test for next five to seven days, the severity of damage and its location and to avoid added expenses/delays to M/s PIAC subject engine can operate for next 50 cycles under monitoring of distressed condition of the blade damaged beyond limits at 25 cycle interval. (Ref Appendix 'D')
- 45.19 Statement of Mr. Dye contradicts allowable damage limitations on the compressor blades prescribed by

/the

the manufacturer in the Airbus Maint Manual Page-202/203 Chapter 72-31-00. The damage to blade (Ref Appendix B1 & B2) was beyond limits.

45.20. Statement of Mr. Clem Dye that damage observed on the compressor blade beyond Maint Manual limit did not merit an immediate engine removal contradicts the manufacturers requirements prescribed in the Airbus Maint Manual to the operator in the Airbus Maint Manual.

45.21 Statement of Mr. Clem Dye that if at the end of 50 cycle operation permitted by GE no increase in the distress was noted in the compressor blade that was damaged beyond limits, the engine could have continued in service contradicts the conditional operation of subject engine allowed by GE and engine operation was to be discontinued no sooner a spare engine was available.

45.22 Engr. Zaman did not observe all evidence of bird hit on No.1 engine that Senior Engineers had seen and therefore a difference in perception prevailed which was magnified while deciding the need for BSI of subject engine under the circumstances.

45.23 Controversy between Engr. Zaman and Senior Engineers of M/s PIAC whether a BSI of subject engine was required was purely a technical problem that may arise in the maintenance process and was not an industrial dispute as stated by Engr. Zaman Director E & M.

45.24 Engr. Zaman mishandled purely a technical problem and instead of adopting a professional approach in resolving a technical issue adopted a hostile posture, used derogatory and insulting language against Engr. Rais in front of other senior engineers which is against the Managerial ethics and administrative norms.

45.25. The CAA official correctly identified the problem and took correct decision in time by calling the aircraft back and asking M/S PIAC to accomplish BSI of No. 1

/ engine

engine.

- 45.26 Lack of confidence prevails between the top and middle management at M/s PIAC where a Director involved himself in line maintenance functions instead of relying on qualified, trained and experienced managers and engineers who were available.

CAUSES

46. Following are the causes of the incident:-

- 46.1 Wrong assesment by Engr. Zaman of the bird hit damage observed on No.1 engine thereby leading to his incorrect decision to release the engine without accomplishing BSI.
- 46.2. Incorrect handling of a technical problem by Engr. S.U. Zaman Director Engg & Maint that could have been resolved by application of professional skill and airline procedures rather than adopting coercive, derogatory and ruthless managerial style.
- 46.3. Thrusting wrong decision to release an unserviceable aircraft, Engr. S.U. Zaman forced Engr. Munir to clear the aircraft without following the procedure stipulated in the Airbus Maintenance Manual.

RECOMMENDATIONS

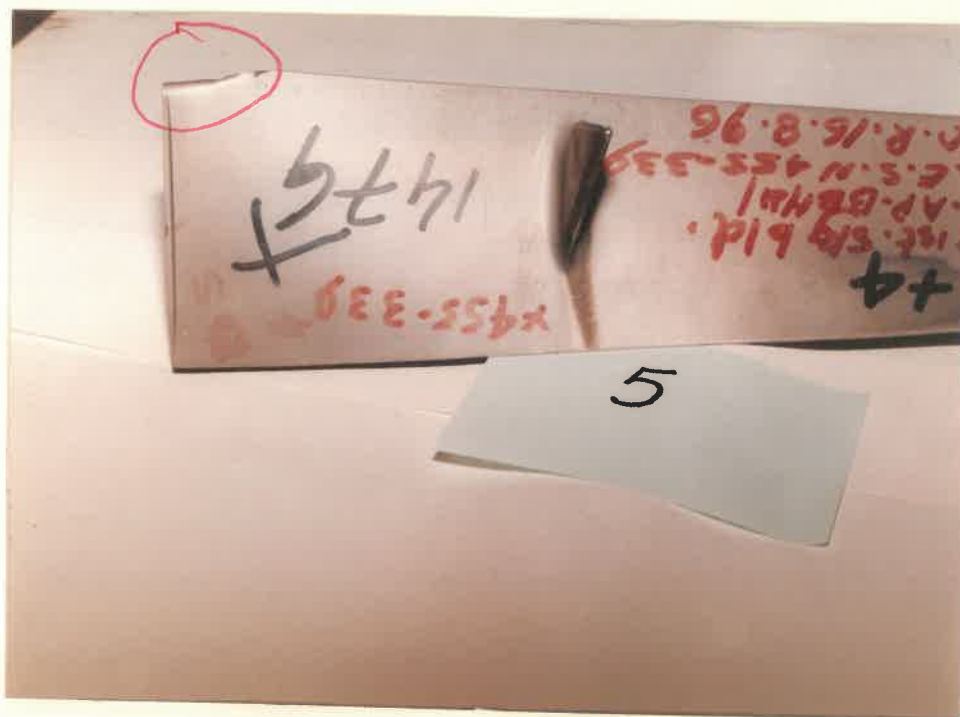
47. The Board recommends that:-

- 47.1. M/s PIAC Management must make endeavour to create organizational culture fostering bonds at all level of management structure essentially required in a sophisticated engineering organization to
/successfully

successfully blend the production and safety goals.

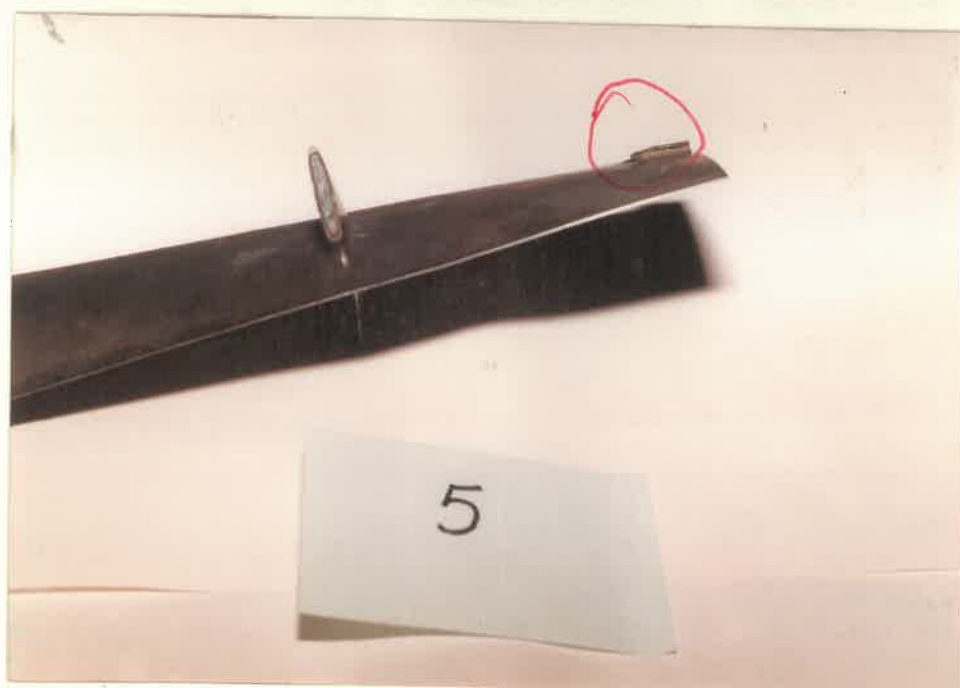
- 47.2. M/s PIAC must train its middle and top management in the realm of '**conflict management**' through regular courses.
- 47.3. Confidence of senior engineers should be restored through display of particepative, consultative and democratic management style by the apex management.
- 47.4. Disciplinary action should be taken against Engr. Shafi-Uz-Zaman AME No.314 for allowing Airbus Reg. No. AP-BBM to operate PK-312 with an engine which was damaged due to bird hit without ascertaining its internal condition through BSI contrary to the requirements of Airbus Fault Isolation Manual Page 133 Chapter 72-00-00 and Air Safety Circuler No. 45. Rule 27 CAR, 94 is applicable.
- 47.5. Disciplinary action should be taken against Engr. Munir Khan AME No. 476 for releasing under unlawful instructions of Engr. Shafi-Uz-Zaman Director E & M, Airbus Reg. No. AP-BBM which had evidence of bird hit without establishing internal codition of No. 1 engine through BSI as required in the Airbus Fault Isolation Manual Page 133 Chapter 72-00-00. Rule 27 CAR, 94 is applicable.

APP. 'B'1



FIRST STAGE COMPRESSOR BLADE LEADING EDGE
TEARED - 3/4 INCH BEYOND LIMITS OF MM.

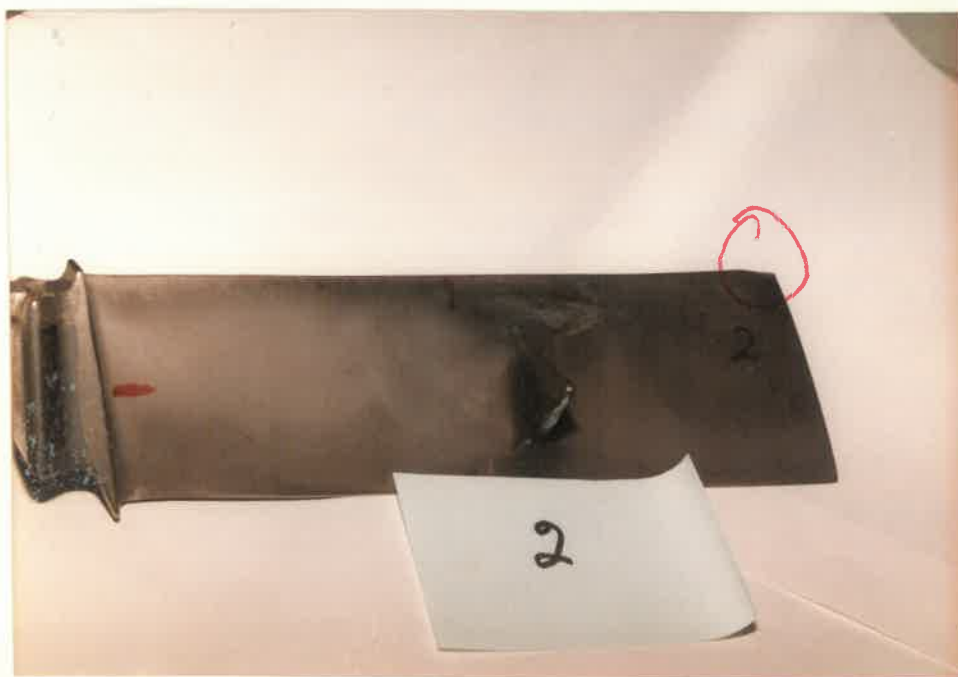
APP. 'B'2



FIRST STAGE COMPRESSOR BLADE LEADING EDGE
TEARED - 3/4 INCH BEYOND MAINT MANUAL LIMIT

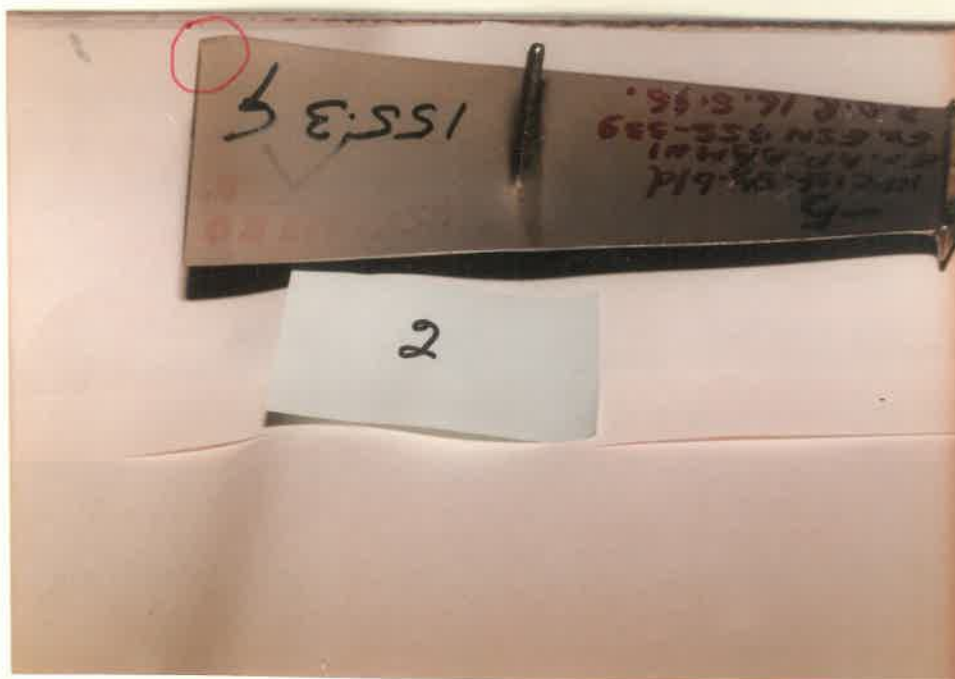
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APP. 'B3



ANOTHER 1ST STAGE COMP BLADE DAMAGE

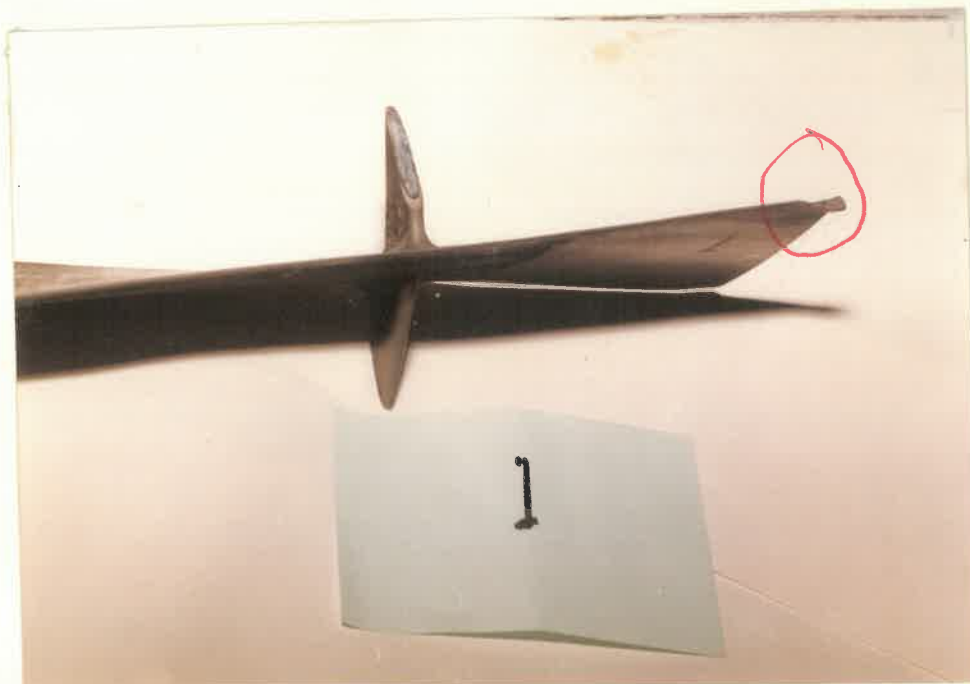
APP. 'B4



ANOTHER 1ST STAGE COMP BLADE DAMAGE

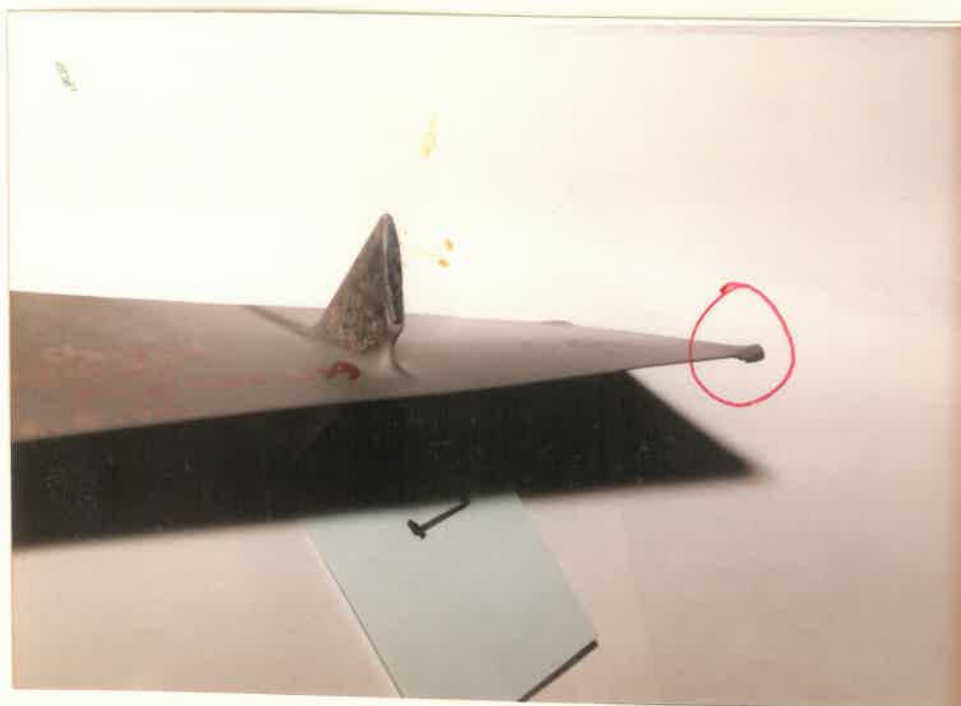
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APP. 'B'5



FIRST STAGE COMP BLADE DAMAGE

APP. 'B'6



FIRST STAGE COMP. BLADE DAMAGE

6
APP. 'B'7



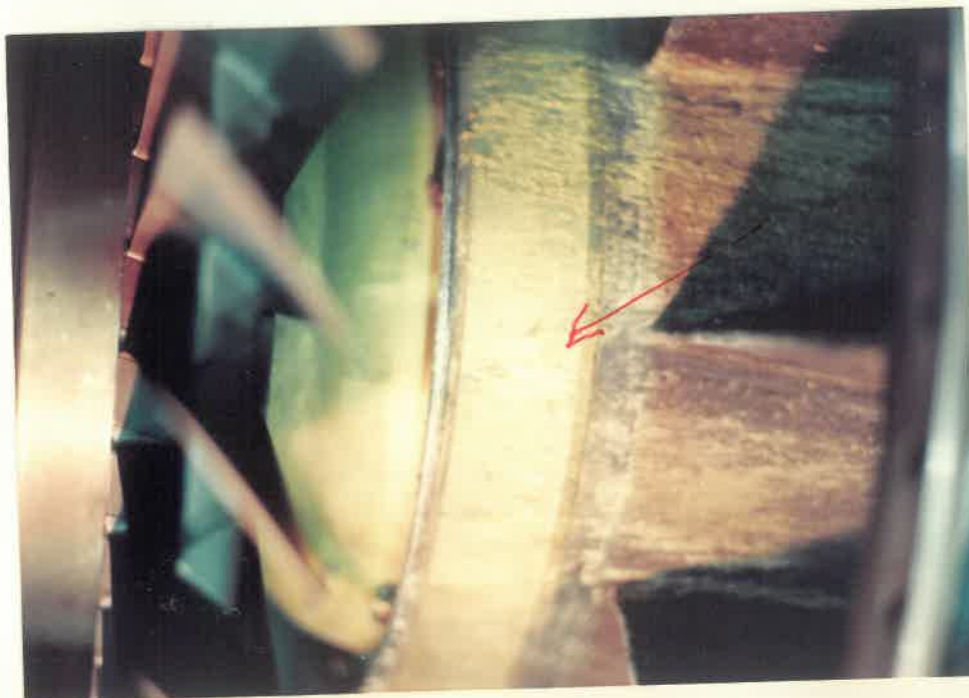
ANOTHER 1ST STAGE COMP BLADE DAMAGED

APP. 'B'8



ANOTHER 1ST STAGE COMP BLADE DAMAGED

APP. 'B'9



EVIDENCE OF BIRD INGESTION IN THE ENGINE IN TAKE

APP. 'B'10



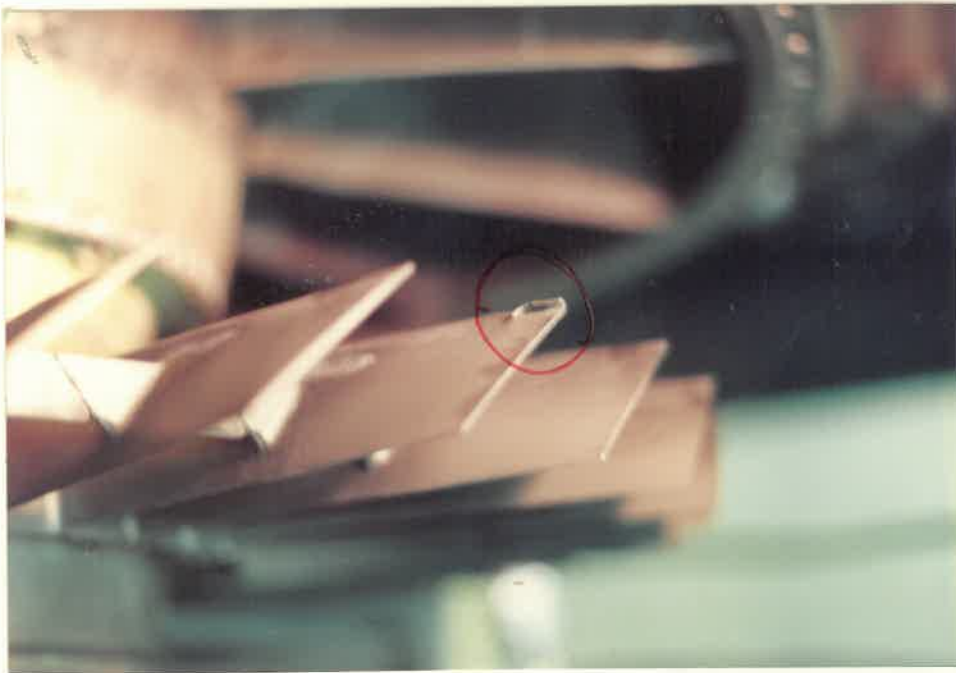
ANOTHER VIEW OF EVIDENCE OF BIRD INJECTION
IN THE ENGINE IN TAKE

APP. 'B'11



EVIDENCE OF BIRD FEATHERS IN THE ENGINE IN TAKE

APP. 'B'12



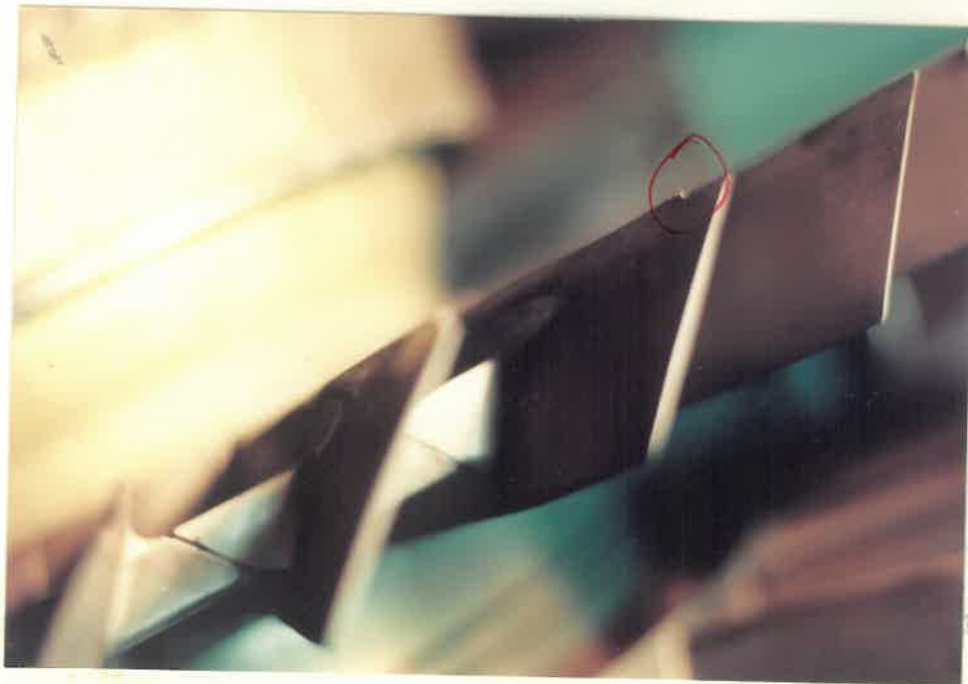
1ST STAGE COMP BLADE DAMAGE

APP. 'B'13



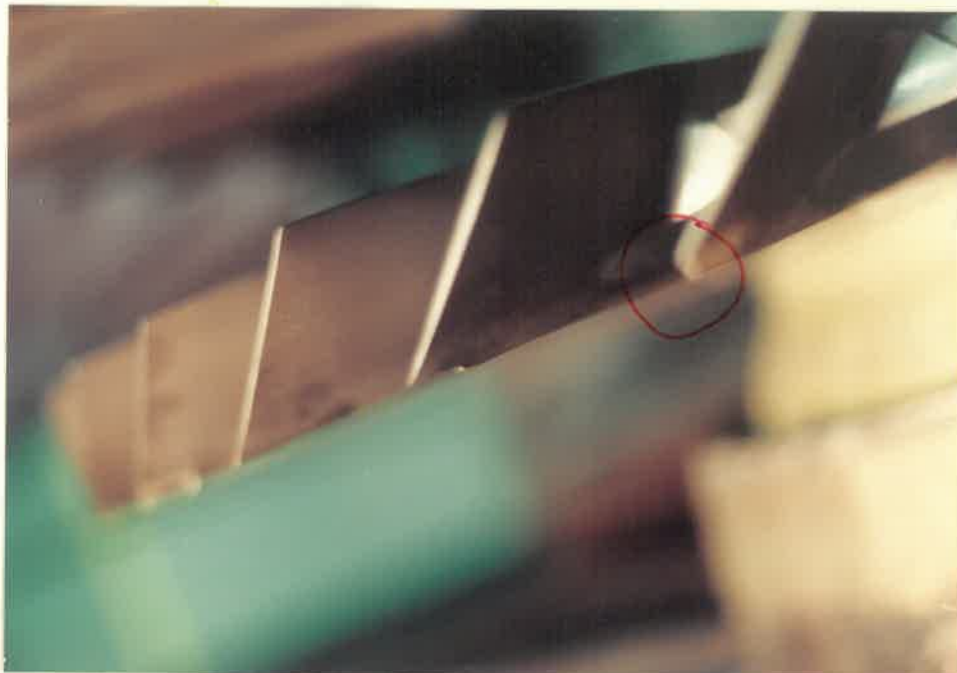
EVIDENCE OF BLADE DAMAGE 1ST STAGE COMP BLADE

APP. 'B'14



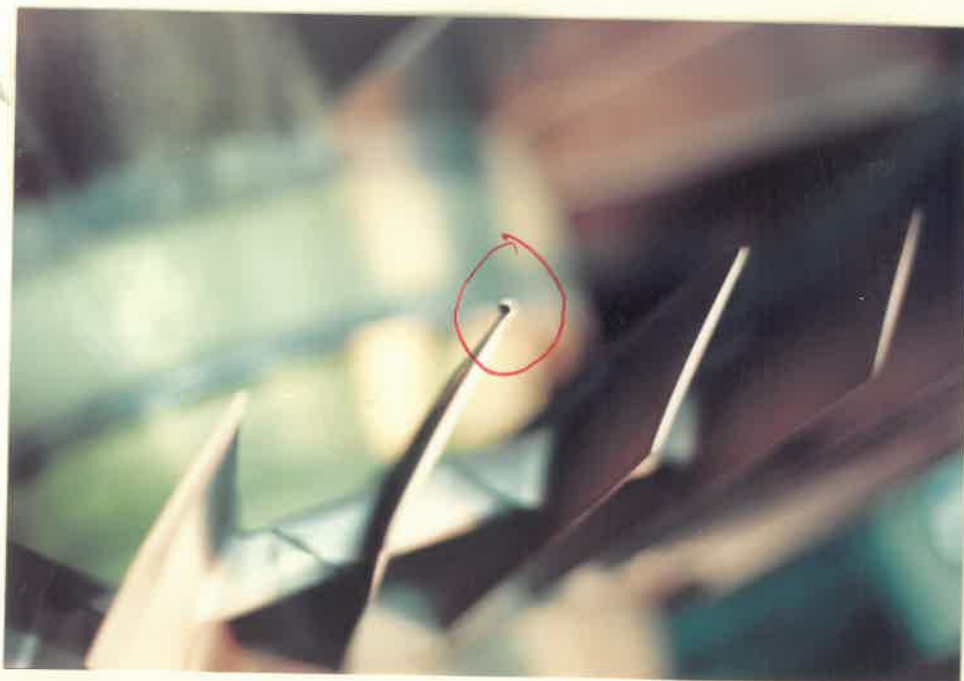
EVIDENCE OF DAMAGED BLADE

APP. 'B'15



EVIDENCE OF DAMAGED BLADE

APP. 'B'16



EVIDENCE OF ANOTHER BLADE DAMAGED