

~~CONFIDENTIAL~~

OFFICE OF VICE PRESIDENT AND SECRETARY

Translation No. C-2486

PETITION

On Appeal From Decision of the Civil Aeronautics Administration

Date: November 26, 1964

To : Ministry of Communications
 From : Air Asia Company Limited
 Civil Air Transport Company Limited

On June 20, 1964 at approximately 5:40 p.m. a C-46 aircraft owned by Civil Air Transport Company Limited (hereinafter CAT) and bearing aircraft registration number B-908 crashed near Taichung, on a flight from that city to Taipei. The flight was part of CAT's domestic service which operated Taipei-Taichung-Tainan-Makung-Kaohsiung and return via the same intermediate points. All 57 persons on board were killed. It was the first fatal crash in the history of CAT's scheduled airline operations spanning some 15 years, and indeed in the 15 years of scheduled civil air operations in Taiwan.

Essential facts as to which there is no controversy include the following:

- (a) The aircraft departed Taichung with almost a full load of passengers (one vacant seat), but virtually no cargo, at about 5:32 p.m.;
- (b) The aircraft took off in a southerly direction, then proceeded to turn easterly and northerly until it reached a general northerly direction;
- (c) In its last contact with ground control, the aircraft crew, several minutes after take-off, stated that all was well;

Distribution:

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CATCL: CB

Remarks:

This Petition (and copy thereof)
 duly delivered to and receipted
 by MOC (and CAA) November 26, 1964.



for Office of Vice President and Secretary
 November 27, 1964

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- (d) Upon reaching a point approximately six miles north of the Suinan airport (Taichung) and an altitude of approximately 1600 feet (some 5-6 minutes after take-off) the aircraft was seen to turn westward and shortly thereafter descend rapidly along an apparently straight track and strike the ground at an angle of about 30° with the left wing in a slightly low attitude along an azimuth of approximately 280 degrees;
- (e) On crashing into a rice paddy, the aircraft disintegrated;
- (f) Most parts of the aircraft were recovered at the scene, one notable exception being a portion of the left propeller power unit. (This unit was obviously complete on impact, however, as indicated by the fact that the spinner forming its cover was recovered at the site. See photo of subject part appended as Appendix B and propeller assembly attachment to Administration's Report).

Quite understandably, the tragic loss of life in this accident gave rise to feelings of horrified shock in every quarter. These feelings were rendered none the less intense by the fact that the deceased passengers included many important figures from the Asian motion picture industry, who had just concluded their participation in the Asian Film Festival and were returning from a sight-seeing trip to Taichung. Among these were Loke Wan Tho of Malaysia, one of Asia's most important industrialists, his wife and several of his colleagues. Also, world-wide attention was made inevitable by the fact that 19 Americans were among the dead.

Immediately, multi-faceted investigations were undertaken in an atmosphere of considerable strain and confusion. Responsibility for the supervision of these investigations was assumed by the Civil Aeronautics Administration*. At the invitation of the Ministry and presumably because of the lack of locally available personnel skilled in

*Unlike the basic aviation laws of certain other nations, the Civil Aviation Code does not spell out the safety investigation responsibilities of the Administration or of the Ministry of Communications (cf., e.g., Title VII of the U.S. Federal Aviation Act of 1958). Petitioners, however, do not object to the fact that such investigations were ordered under the Ministry's and the Administration's general powers of supervision of aviation and under the provisions of the duly promulgated Civil Air Regulations. On the contrary, petitioners, vitally concerned with the continuing safety of air transportation generally, welcomed the fact of these investigations and undertook to cooperate wholeheartedly therewith.

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this field and the sizeable number of American casualties, two U.S. Civil Aeronautics Board experts were brought from Washington to join the investigation team. Analysis of evidence collected at the scene of the crash was begun. After several days, the wreckage was removed to Tainan to permit more searching study. At the same time the first Accident Board Meeting was convened on June 25, 1964 and inquiries were begun into the history of the flight and of the aircraft and into the backgrounds of the passengers. Because of pressure from various sources (including members of the Legislative Yuan, the Control Yuan, various news media and representatives of persons killed in the crash) it proved impossible to carry forward these investigations in the detached and analytical atmosphere necessary to valid conclusions. Drafts of various reports of investigation were concluded as early as July 13, and a second Accident Board Meeting held the following day*.

On July 15, 1964, the Minister of Communications, when called before the Legislative Yuan, summarized the findings of the Board under the title "Salient Points of Investigation Report", as follows:

- "1. The Accident Inquiry Board is unanimous in eliminating the following factors as possible causes of the accident:
 - (1) Weather;
 - (2) Air traffic control;
 - (3) Navigational aid;
 - (4) Age of plane or metal exhaustion of part of airframe structure;
 - (5) In-flight fire;
 - (6) Crew time in excess of prescribed limits;
 - (7) Fuel.

- "2. Mr. Pahl pointed out that from an inspection made of all airframe structural parts, there was no evidence that the aircraft had any crack from metal exhaustion or any crack that could lead to structural failure prior to crash, the burns and damages on all airframe parts being all found as to have arisen from fire upon impact with the ground.

- "3. USCAB experts who tested on the control cables affirmed in a report that the cable used for control of right elevator trim

*at this second meeting, the Board allowed virtually no participation by the Petitioners in its analysis and deliberations. Only one representative was permitted to attend and he was isolated from the Board. Two others were called in for cursory questions only. No opportunity was afforded to submit the results of Company investigations in any detail.

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tab was broken upon impact with the ground, not during flight, but that the cable used for control of left elevator trim tab showed substantial wear and tear, although the breakage was more probably also due to impact with ground. The majority board opinion is that even if these cables became broken during flight prior to crash, the crew should have encountered no particular difficulty in controlling the plane in continued flight.

"4. Mr. Hallman who inspected the two engines stated in his report that the engines had no obvious trouble, but that because the power unit for left propeller was yet to be located from scene of crash, search for the power unit should continue in order to enable further study and evaluation of condition of flying for the very short moment just prior to crash. Mr. Hallman further pointed out that the engine manifold gage readings were similar for both engines and that blade butt gear damages sustained upon impact with ground were located at approximately similar positions and for an approximately similar number of gear teeth, although there was a difference in RPM of more than 1,000. The Board deemed that such would obviously give rise to overspeeding of left propeller.

"5. Based on the substantial wear and tear of left control cable and the overspeeding of left propeller, the Board deemed that normal time maintenance for the aircraft was not attentively carried out and that there was also indication of improper handling on the part of the pilot."

Although these points (a) were arrived at in the hurried fashion just described, (b) differed substantially from the reports of the American experts to the extent of reversing those experts' findings on crucial issues, (c) failed to accord with the available evidence and (d) ignored vital areas of possible cause, they survive in only slightly altered form in the CAA's final report, first made available to Petitioners on October 27, 1964, an abridged version of which appears to have been furnished to the Legislative Yuan on October 3, 1964. Their adverse effects upon Petitioners are widespread and virtually irreparable, because they (a) severely and in unwarranted fashion damage CAT's worldwide reputation for scrupulous adherence to safety standards in its flight operations and (b) unfairly accuse Air Asia Company Limited, one of the world's most highly regarded maintenance companies, of accomplishing CAT's aircraft maintenance in "inattentive" fashion.

On the basis of the matters hereinafter discussed and of all of the evidence, the Ministry of Communications is respectfully asked to remedy, to the extent now possible, these unwarranted findings and to rule as follows:

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1. The investigation by the CAA of this accident was not properly pursued in numerous particulars, and the validity of its findings are seriously compromised as a result thereof;
2. There is no credible evidence that the accident resulted from an overspeeding left propeller or a loss of power from the left engine (or any other mechanical malfunction);
3. There is no credible evidence that the accident was due to poor piloting technique or any other deficiency on the part of the aircraft crew;
4. There is nothing in the condition of the left trim tab control cable (or any other part of the aircraft, engines or propellers) to suggest, much less establish, that maintenance of aircraft B-908 was not carefully and properly accomplished.
5. On the basis of all the evidence, the cause of the crash remains unknown, but investigation should be continued and even broadened to include, inter alia, more searching analysis into the possibilities of attempted high-jacking or other violent developments aboard the aircraft.

I.

The Conduct of the CAA's Inquiry Renders
Unreliable its Conclusions.

The atmosphere surrounding the CAA's investigation, outlined above, may tend to excuse, but certainly not justify, its premature conclusions with respect to the accident, from which it has consistently refused to retreat. The errors of substance to which this hasty approach has led are analyzed in later portions of this petition. For present purposes, attention is invited to the following defects in investigative technique and evaluation that underlie its report:

A. The Attempt to Reach Early Conclusions.

The "Investigation and Work Agenda" contained in the Administration's report shows that in total 27 days in an elapsed period of 30 days were expended in investigation and study of this accident. Five such days were after the announcement to the Legislative Yuan of the "Salient Points" and were taken up largely with documentation of those points, translations, etc. By contrast, the U.S. Civil Aeronautics Board (the world's most experienced body in matters of this kind), for example, invariably takes many months and even years to

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pinpoint, when possible, the causes of air accidents*. Moreover, the minutes of the Accident Board meeting of July 14, 1964 show numerous areas wherein the investigation was incomplete, and the consensus of the meeting was that the work of the Board was far from completed**, yet the CAA's agenda shows that the "Salient Points" were prepared and printed on July 14, 1964, following the meeting.

Intensive public pressure for immediate answers as to cause of catastrophes that may involve the human element is not confined to aircraft accidents nor to the Republic of China. But only by slow and painstaking collection of data from all sources of conceivable relevancy and by careful analysis of such data, free from pressures to reach quick conclusions and to avoid retreat from conclusions once reached, can accident investigation provide meaningful contributions to the ultimate purpose -- the prevention of recurrence. It is respectfully submitted that the rush to premature determinations, undoubtedly impelled by the inquiries of the Legislative Yuan, largely defeated the essential purposes of the CAA investigation.

B. The Failure to Utilize the Expertise of the American Experts.

It is clear from the minutes of the second Accident Board Meeting that the two U. S. CAB experts invited to assist in the accident investigation had reached no final conclusions as to cause prior to the release of the "Salient Points" on July 15, 1964. It is also the fact that the latter portion of Point 4 and all of Point 5 were prepared and released to the Legislative Yuan without the concurrence of those experts and, as will be later explained, contrary to their findings. Yet these were men whose careers are devoted to the investigation of air crashes and analysis of the results of those investigations. Their experience in this field dwarfs any available to the petitioners, the Administration

 *For example, the U.S. CAB Report of the Pacific Air Lines accident of May 7, 1964 wherein the evidence pointed plainly to murder of the pilot and the co-pilot by a despondent passenger, was not released until October 30, 1964. The deliberate nature of this process was noted for the Second Accident Board Meeting by one of the American CAB experts.

**There are none the less disturbing signs of prejudgment in some of the statements at the meeting that "high-jacking as a cause can be eliminated" despite an inconclusive report of the Police on this subject.

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or the Ministry. To have utilized these valuable services and then cavalierly to have ignored their potential contribution to a determination of the cause of the accident is possibly the most regrettable aspect of the entire handling of the matter.

C. The Self-Imposed Strictures on Investigation.

It appears that at an early point in its inquiry the Administration sought and received police support in its investigation of the presence of two stolen pistols carefully secreted aboard the aircraft in artfully hollowed out books, by one or both of two passengers who had made simultaneous reservations. At some point thereafter, however, it determined that this aspect of the case was not within its purview. Thus, the following exchange took place at the second meeting of the Accident Board:

"Mr. Chen: As a member of this committee, I am of the opinion that the security matter should not be treated in a hurried manner. We should allow for sufficient time."

"Mr. Hsiac /Deputy Director, CAA/: This committee should not intervene in the security aspects, but be concerned with technical matters relating to the mishap."

Also, as previously noted, the Administration had concluded as early as July 14, 1964 that high-jacking as a possible cause could be disregarded, although the police report at that time stated that further investigation was required.

Understandably, security matters involve a sensitive area in any country, but meaningful investigation cannot result if any factual area is ruled "off-limits", so to speak, before complete exploration.

D. Significant Alteration of Source Material.

As part of their contribution to the investigation, the American experts prepared careful reports of their findings and furnished these to the Administration for its use. As is made clear in later sections, the Administration's report accepts and uses authoritatively major portions of these reports, but alters others and ignores the remainder. Particularly since some of the altered findings relate to laboratory examinations made as far away as Washington, D.C., U.S.A.*, the conclusion is inescapable that evidence was

*For example, the laboratory findings that a cable showed "serious wear" is altered in the CAA report to read "previous wear", to fit a conclusion that the wear antedated the accident. The laboratory report concluded the contrary.

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evaluated against a pre-conceived result, rather than the converse. (a detailed analysis of the charges made in the reports and the effect of such charges is attached hereto as Appendix A.)

E. The Failure to Follow Accepted Medical Investigation Techniques.

The Republic of China is a signatory of the Convention on International Aviation (commonly called the Chicago Convention). Pursuant to Article 37 of the Convention, it thereby undertakes to collaborate with other states to assure the highest degree of uniformity in inter alia investigation of air accidents. While it is true that B-908 was not being operated in international aviation, it is nevertheless obvious that the medical investigation procedures of other member countries are a highly authoritative guide in this area and should have been followed, in substance at least, in the Administration's investigations. Possibly the most guide of an ICAO member state is the handbook of the U.S. Federal Aviation Agency entitled "Aviation Medicine Participation in Aircraft Accident Investigations". The techniques outlined in that handbook for use in all accidents were not followed in the following particulars:

- (1) No complete autopsy was performed on the first officer and a complete autopsy was not had of the captain until ten days after the accident (the latter fact invalidating most chemical findings because of putrefaction, most importantly the nitrate test for gun powder);
- (2) The Administration's report gives no indication that blood alcohol tests were conducted on either crew members or passengers;
- (3) The Administration's report gives no indication that tests were conducted to determine the presence or absence of carbon monoxide in the bodies of passengers and crew, although this test may provide valuable information on the time element of incapacitation (before or at impact).

The FAA also suggests that where hypoxia (lack of oxygen) is a possibility, a lactic acid analysis of brain or spinal cord tissues is useful to establish whether such a condition may have disabled the crew members prior to impact.

Further, it is important, in the FAA's view, to check for the presence (in stomach contents, tissues of the liver, brain, kidney, lung) of any evidence of barbiturates, dexedrine, tranquilizers or antihistamines.

Apparently none of these steps was accomplished in the course of the Administration's investigation.

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II.

There Is No Credible Evidence That Any Malfunction
Of The Left Propeller Or Left Engine Caused The Accident

In the "Salient Points" announced on July 15, 1964, it was concluded that "left propeller had overspeeding trouble". A similar conclusion is contained in the report to the Legislative Yuan of October 3, 1964. Also, it is concluded in the report to the Legislative Yuan that "B-908 lost power on the left". No valid support for either conclusion is to be found in the record. Since the propeller and the engine form a single assembly, connected by a reduction gear which serves to reduce propeller revolutions to 1/2 those of the engine, the evidence on this score may be analyzed simultaneously. Recovered mechanisms of the left propeller showed damage closely paralleling that of recovered right propeller like mechanisms and indicated a similar pitch (approximately 30°). This similarity was true not only of the damage to the gear teeth themselves but also of the gouge marks made by them in the steel propeller hubs when the blades were forced therefrom on impact. These conditions were noted in the American experts' "Report of Investigation of Power Plant" of July 14, 1964. Further, the manifold pressure gauge analyses appended to the August 14, 1964 revision of the original structures report showed that both engines were developing approximately the same power at the time of impact as evidenced by the fact that their concentric-shaft indicators were seized together at the same setting when bent over the face of the instrument by impact forces. The combination of similar pitch plus similar power settings points to the single and inescapable conclusion that both engines and propellers, right and left, were operated similarly at the time of impact.

Moreover, the conclusions of the American experts, as evidenced by their report just cited, is that at impact both power settings approximated 40 inches (of mercury). This reading would be approximately that to be anticipated for an aircraft of this type under the circumstances and attitude of flight obtaining at the time of impact.

The Administration's Report failed to credit the analyses contained in these reports; indeed, in incorporating the reports into its own, it changed them significantly. To the experts' finding that "this position of the power gear and adapter plate was noted and subsequently determined to represent an approximate 30° blade angle," the Administration added "but did not agree with what was indicated by the damaged root gears", a statement completely contradicted by other portions of the experts' report. Similarly, the experts' report that gear damage, when correlated with blade angle, represented angles of approximately 30°, was altered to read that "the place of damage . . . was not all at 30° blade angle." And whereas the experts' report concluded that left propeller damage represented blade angle of 30°, or essentially the same as the right propeller, the Administration's report described the damage marks on the teeth of two blade gears as "at low pitch positions" seemingly in an effort to

differentiate these marks from those found on the right propeller.

The source of the Administration's error in this regard may lie in undue reliance on certain readings of the engine tachometer (inaccurately described in the Administration's report as a propeller speed indicator). This instrument actually measures engine speed, but since the two speeds are correlated, the instrument would under normal conditions also give a reliable indication of propeller speed. The American expert, after noting a wide range of possible conclusions from the damage to the two tachometer drive gears (one for each engine), stated as follows:

"In operation, the tachometer pointers are relatively lightly restrained at an indicating position and sudden movement of the instrument will cause the pointers to swing widely. This fact greatly compromises the reliability of any impact induced damage as an RPM indicator. The multiple damage areas on the teeth support this statement".

BUT ALSO SUGGESTED IN THEIR JULY 14 REPORT

Despite this ^{FACT STATED} warning (contained in the experts' report of ^{AUGUST 14,} ~~June 20,~~ 1964), the Administration concluded in its "Salient Points" that a difference in RPM of propeller of more than 1,000 (or a difference in engine speed of more than 2,000) was being experienced at the time of the accident*. (Although the sentence in which this conclusion is stated begins "The expert" further pointed out that" the conclusion as to RPM's is the Administration's and not that of the experts.) Assuming normal operation of the right engine (approximately 2,300 RPM under the circumstances) as indicated by the Administration's report and all other sources, the left engine at any such greatly excessive speed would quickly destroy itself; yet the experts found no evidence of distress in either engine. It was stated:

"Except for this obvious impact damage, all observations of the cylinder and piston assemblies and the interiors of the crank case were normal."

It also appears from the Administration's report that its conclusion of overspeeding of the left propeller may be based in part on "unusual, loud sound" reported by seven of the 20 residents

*In its report it also ascribed to unidentified CAT technical personnel a statement that the left propeller was developing 2500-2900 RPM's at the time of the accident (or an indicated engine speed of 5000-5800 RPM's). CAT's "C-46 Flight Manual, on file with the Administration, is based on the manufacturer's applicable service bulletin, and provides:

"The following engine speeds have been established as the maximum overspeed limits beyond which it is considered advisable to disassemble and inspect subject engine:

Engine Model R-2800: maximum limit 3100 RPM (with slight throttle opening), 3350 RPM (with large throttle opening)"

U.S. Air Force limits are identical. Clearly, speeds of the order of 5000 RPM would have left indelible evidence in the engine or, more likely, destroyed it completely.

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in the neighborhood of the crash. But, a sense of "unusual, loud sound" would of course be explained by the unaccustomed closeness of those near the descent of a large twin-engine aircraft with power on. And the fact is that such great overspeeding of a propeller would be accompanied by a high pitched whine, a circumstance not reported by a single witness, according to the C.I.D. report attached to the Administration's report.

Although nowhere discussed in the text of the report as relating to the accident, certain statements in the reference data appended to the report required comment, lest they be misunderstood. It is suggested that a failure to effect certain modifications in the Curtiss Wright Electric Propeller may lead to "loss of power and control" and to "pitch change malfunction" and that such modifications were not made in B-908. The facts, however, are:

- (a) The modification referred to is a U.S. Air Force Technical Order, never applied by any civil aviation authority anywhere prior to June 20, 1964, and the unmodified version (but not the modification) is approved by the USFAA, the country of manufacture of the propeller;
- (b) The Administration's description of the modification is inaccurate, including particularly the reference to 5/11" screws;
- (c) The fact is that the parts required to effect the modification are not available from the manufacturer, because produced only for the Air Force;
- (d) Contrary to the Administration statements, such modification was not directed by the manufacturer, and manufacturer's directions do not have the force of regulation;
- (e) Failure of the brake assembly would only have negligible effect upon aircraft performance, resulting only in a variation from optimum propeller pitch of a fraction of a degree;
- (f) Beyond the action of the brake assembly, the propeller mechanism incorporates two safety features, one electric and the other mechanical, assuring that the propeller blade angle does not assume an improper setting;
- (g) A damage-free condition was observed in the mechanical safety features (two fixed metal stops on the left propeller adapter plate, which were recovered); such damage would inevitably occur if the propeller had tended to move beyond prescribed limits;
- (h) No history of "pitch change malfunction" by virtue of electrical connections or otherwise has been experienced in the 20-year history of operation, so far as petitioners are aware;

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- (i) All evidence points to a propeller pitch of 30 degrees on both propellers at time of impact, thus negating any malfunction of any portion of the propeller mechanism.

III.

There Is No Credible Evidence Of Improper Piloting.

Point V of the "Salient Points" contains the statement "there was also indication of improper handling on the part of the pilot". In the full report it is suggested that this improper handling consisted of turning left, when power had been lost on the left side. It has already been noted that the loss of power on the left side is not only unsupported by, but also in direct conflict with, the available evidence. Moreover, even if the contrary were assumed arguendo, a left turn would violate none of the emergency procedures laid down for single engine operation of this aircraft. No twin-engine aircraft can be certificated for transport operations in the United States (the country of manufacture of the C-46) unless it can continue to climb in normal fashion on a single engine up to its single-engine "service ceiling". (In this case, at least 8,000 feet, or several thousand feet higher than B-908's altitude prior to its descent and crash). CAT's C-46 Flight Manual, on file with the Administration, provides that, when an engine failure is experienced in flight on this type of aircraft, normal traffic procedures are to be followed until arrangements can be made for a landing, and of course normal traffic procedures will often entail turns to the left. (This manual is based upon an accumulation of two decades of experience with the basic aircraft and the operating specifications of the manufacturer and the experience of other operators.) It follows, therefore, that no distress sufficient to explain this accident would accompany a loss of power of one engine, even if complete, particularly at the altitude already attained by B-908.

Against its unsupported findings of pilot error, the Administration also failed to weigh the fact that both Captain Lin and First Officer Kung had many thousands of hours of piloting experience (approximately 12,000 and 13,000 respectively) and had been soundly educated and trained in their craft. The depth and breadth of that experience alone suggests the peril of any conclusion that both failed to react to a situation which is fully covered in all twin-engine pilot training, and one in which CAT pilots are drilled in their periodic (every six months) proficiency check under much more unfavorable conditions in that loss of power is induced during takeoff. Turns into the "bad" engine are also part of this periodic drill, and the C-46 is noted for its stability when operating on one engine and particularly when making turns into, or even circling toward, the "bad" engine. Thus it is inconceivable that these two long-experienced, competent and well-trained pilots would have been presented with any undue difficulty by the loss of power of one engine or by turning in the direction of it.

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IV.

There Is No Credible Evidence of Inattentive Maintenance of the Aircraft.

Following the accident, and as part of the investigation, a section of control cable which had fractured was taken from the wreckage for examination. This cable was composed of seven strands of steel wire, each strand in turn consisting of seven smaller strands. While in normal flight this type of cable is subject to stresses of about 20 pounds, it must, according to manufacturer's specifications sustain 920 pound loads and did in actual tests, sustain loads of more than 1,000 pounds before breaking.

In the examination of the cable, certain "wear" or damage marks were noted on the exterior surface. This circumstance was cited in the "Salient Points" as indicating "inattentive maintenance" of the aircraft. Although the full report in its conclusions agrees with the experts' opinion that even a complete failure of the cable could not cause the pilot to lose control, and hence could offer no explanation of this accident, the wear of the cable is still cited as evidencing "inattentive maintenance".

Again the Administration has ignored the experts' findings on this subject, which after U.S. CAB laboratory examination, concluded as follows:

"It is possible that some of the individual wire fractures could have included fatigue cracking, with subsequent obliteration of the characteristic fracture surfaces due to moving interference with a hard surface at high pressure. However, it appears more probable that both the wire fractures and the wearlike damage on exterior wires of the cable occurred during the disintegration of the airplane on impact with the ground. No positive indication of significant wear or other unairworthy condition of this cable prior to impact of the airplane with the ground was found during this examination."

It is obviously impossible to harmonize the foregoing with the Administration's statement in its recommendations to the Legislative Yuan some months after the cited report that "substantial wear and tear of control cable prior to crash has been noted at time of inspection of plane remnants". But the Administration's error goes deeper. While the preliminary findings of the American experts noted "serious wear", the Administration's report changed the language to read "previous wear" (underscoring added). To this date, so far as is known to Petitioners, the Administration has not reanalyzed its position to take into account the results of laboratory examinations, which absolve Petitioners from the very serious charges leveled at them by the Administration's report.

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The Administration's report also states that in effect CAT has admitted "inattentive maintenance" by seeking to attribute to Mr. Gluskin of CAT, a CAA inspector, an admission shortly prior to the accident that an increasing frequency of delays was being experienced and that some of these were due to mechanical failures. No such construction can fairly be put on Mr. Gluskin's language, as a review thereof will show. Rather, Mr. Gluskin in response to a letter from the Administration on the subject expressed CAT's concern with any schedule delays, and promised wholehearted cooperation with the Administration in seeking to eliminate causes, without compromising safety standards. Further, an operator's decision to delay an aircraft for repairs when a defect is detected, rather than proceeding to fly it with some possibly unsafe but not necessarily prohibitive defect, shows a concern for, rather than a disregard for, flight safety. CAT's enviable record of nearly 15 years scheduled operation without an accident (with there being no credible evidence that this first accident was the fault of the operator and considerable evidence that it was not) testifies to a serious concern for safety of flight and impeccable maintenance.

V.

No Cause of the B-908 Accident has been Established, and Investigation Should Continue, Particularly into Aspects Not Yet Fully Explored.

It is submitted that the technique of investigation and analyses herein pursued, and the announcement of conclusions not rationally supported, requires corrective action by this Ministry. Petitioners have no desire to castigate anyone, although they have themselves been castigated before the public unfairly and unceasingly since the accident. Rather it is their hope, as presumably it must be the hope of the Administration and of the Ministry, that, at the very least, improvements in the safety of flight may result from the tragedy that marked the crash of B-908.

Reanalysis of the available evidence should be undertaken in an atmosphere of scientific detachment. Particularly the investigation of possible incapacitation of the crew members by violence, or the threat of violence, should be pursued until the many questions remaining in this area are answered to the extent that they can be answered.

It has been increasingly evident throughout the world that the threat of violence aloft is a real and alarming one. High-jacking of aircraft for various reasons, while perhaps not commonplace, has occurred with considerable frequency. Also, several years ago near Denver, Colorado, U.S.A., a man murdered a plane load of people to collect his mother's insurance. More recently, a despondent

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garbler caused the death of 44, including himself, by shooting the pilot and the co-pilot in flight near Stockton, California. These and other incidents suggest the importance of thorough investigation of the background of all actual or suspicious situations where violence may have played a part, with a view to evolving protective measures for the safety of air travel.

It is solely in the interest of such improved safety that Petitioners suggest that further official inquiry appears vital into the actions of one or more passengers in bringing aboard in secretive fashion two stolen pistols which were found in the wreckage. A confidential report of facts then at its disposal bearing on this subject was furnished to the Administration some time ago by CAT. No analysis thereof is contained in the Administration report, or elsewhere, to petitioners' knowledge. It is no answer to say that this is not a field wherein the Administration is expert; presumably, expert assistance can be borrowed from other agencies of government. The real point is that the Administration has the responsibility of investigation air accidents and their causes; and divided responsibility may well mean no responsibility at all. A very large gap in the sphere of air transport regulation will be opened up unless this Ministry assures that all directly possible causes of the B-908 tragedy are probed to the fullest, particularly in the absence of valid evidence of mechanical or operational causes.

Evidence

The evidence upon which Petitioners rely consists of the CAT's records and reports relative to its decision and the reports of the U.S. Civil Aeronautics Board experts incorporated therein and as supplemented, all as contained in official files of the Government of the Republic of China.

Air Asia Company Limited
Represented by: Hugh L. Grundy, President

Civil Air Transport Company Limited
Represented by: Wensan Wang, Chairman of Board

cc: Civil Aeronautics Administration

Conclusions

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The CAA reports alter the statements on the left propeller blade angle and the left elevator trim tab control cable in the U.S. CAB experts' reports to give an entirely different meaning than that in the original reports. The evidence on propeller blade angle and the left elevator trim tab control cable from the U.S. CAB experts cited in the preceding analysis, alone, directly contradicts the CAA reports' findings of "inattentive maintenance" and "improper handling by the pilot". Air Asia Company Limited's examination of the left propeller hub and power gear, cited in the preceding analysis, and additional statements in the U.S. CAB experts' reports, correctly quoted in the body of the CAA reports but ignored in their analysis, provide further evidence contradicting the CAA reports' findings.

The U.S. CAB expert's report on powerplants found no evidence of failure or distress of either engine. Examination of the engines indicated both were functioning properly at the time of impact. There would certainly have been evidence of damage to the nose section or other internal parts of the left engine had there occurred the overspeeding of the engine to the extent which would have resulted had the alleged left propeller overspeed been even near the 1000 rpm noted in the 130 page CAA report.

The U.S. CAB expert's "Report of Examination of Manifold Pressure Gage" attached to the 14 August 1964 revision of the "Structures Investigation Report" and the earlier powerplant report both found that the damage to the manifold pressure gage dial and pointers indicated the manifold pressures of both engines most probably were 40 inches (of mercury) at the time of impact. This indicates both engines were developing normal power and that the propellers were rotating at approximately the same speed. Any significant difference, especially one of the magnitude suggested by the CAA reports, between the speeds of rotation of the two propellers would have made the manifold pressures of the two engines differ.

Furthermore, operating procedures prescribe that in the event of an overspeeding propeller (an infrequent, but occasional happening faced by all operators of propeller aircraft) the first corrective actions shall be pulling the aircraft up and retarding the throttle of that engine (a change in manifold pressure is one result) followed by actions to restore control of the propeller and, if normal functioning is not promptly restored, to adjust directional trim of the aircraft to compensate for loss of power or drag effects of the malfunctioned powerplant on one side of the aircraft. CAT pilots are trained and drilled in these emergency procedures and are required before being checked out as pilots-in-command to demonstrate competency to safely fly the aircraft, under these emergency conditions, not only in the relatively comfortable circumstances of the on-course climb at some 1500 feet altitude estimated for B-908 but under the far more exacting flight regime of take-off, where altitude, airspeed, and time are critical factors. These pilots have repeatedly demonstrated, and were required periodically to demonstrate, such competency. Unquestionably, then, the pilot's first reaction would have been to reduce power on the left engine (and thus reduce manifold pressure) had there occurred an overspeed of the left propeller. The creditable evidence of the manifold pressures of the two engines having been the same at time of impact, corroborated by the evidence of the directional trim indicators having indicated a normal flight setting of about zero trim, combines to reinforce other evidence that the left propeller was not overspeeding as alleged and that the pilots did not mishandle the aircraft.

The U.S. CAB expert concluded that not only the left propeller but also the right propeller blade gear angle was approximately 30° . With the same blade angle the speeds of the two propellers would certainly be similar but the CAA reports conclude that only the left propeller was overspeeding.

The CAA 130 page report in citing a "left propeller rpm indication" (page 65 of translation and page 91 of the Chinese version) indicates a lack of understanding of the C-46 engine. The crankshaft of the engine and the propeller are coupled by a reduction gear mechanism so that the speed of revolution of the engine is always twice that of the propeller to which it is coupled. Thus if the left propeller had attained the speeds cited the engine speed would have been more than twice its normal 2300/2400 rpm for the phase of flight involved. There was no evidence of the very severe damage to the engine that would have occurred had there been such an overspeeding as alleged.

There in fact is no propeller speed indicator. A tachometer, however, indicates engine rpm. The rpm indications referred to by the CAA 130 page report could only have been among the multiple indications of engine rpm from the damaged tachometer.

The CAA 130 page report cites the rpm indication as evidence of propeller overspeeding. Yet in the same report it notes the U.S. CAB expert's finding that further examination was required and that it might be difficult to reliably determine rpm from the tachometer. The CAA 130 page report ignores the U.S. CAB expert's conclusion (in the "Report on Tachometer" attached to the 14 August 1964 revision of the "Structures Investigation Report") after further examination that the indications of rpm from the tachometer are relatively unreliable.

Thus there is no reliable physical evidence to support and abundant physical evidence to contradict the CAA report conclusion that the left propeller was overspeeding and that the left elevator trim tab control cable was worn prior to the crash and therefore there had been inattentive maintenance. And since the reliable physical evidence shows the finding of left propeller overspeeding to be erroneous there is no basis for the CAA finding that there was improper handling by the pilot.

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062643781

28 September 1964

MEMORANDUM FOR: Mr. Houston

Attached is the HBILKA version of the B908 affair. As you will recall, the Company has not submitted a report to the Ministry of Communications or the Legislative Yuan. The Ambassador was opposed to submitting a report of this nature.

We have asked by cable (last week) for the concurrence of the Ambassador [redacted] to submit a report, such as the attached, to the Chinese Aeronautics Association and the Ministry of Communications. There are valid points pro and con in doing this, but I feel the weight of argument is to take a position and submit a report. (b)(1) (b)(3)

I will be away for ten days to two weeks. Would you please follow this and if no response from Taipei, send a follow-up query. Please return the attachment when it has served your purpose.

[redacted signature block]

R. L. Bannerman

Att:
As stated

(b)(6)

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