MINISTRY OF COMMUNICATIONS AND TRANSPORT

ACCIDENT INVESTIGATION BRANCH

CIVIL AIRCRAFT ACCIDENT NO. CAV/ACC/5/79

REPORT ON THE ACCIDENT TO PIPER PA23-250 AIRCRAFT REGISTRATION NUMBER 5H-TIM WHICH OCCURED ON 2ND JUNE, 1979 1.5NM SOUTH WEST OF MGAMBO JKT CAMP (05°34'S 38°31'E) HANDENI DISTRICT - TANZANIA

AIRCRAFT	:	Piper PA23-250
ENGINES	:	Lycoming 10-540-C 4B5
REGISTERED OWNER	:	Tanzanian Air Services Limited, P. O. Box 364, DAR ES SALAAM.
OPERATOR	:	Tanzanian Air Services Limited.
PILOT	:	One killed.
PASSENGERS	:	Four killed.
PLACE OF ACCIDENT	:	1.5NM South West of Mgambo JKT Camp ($05^{o}34'S$ $38^{o}31'E$) Handeni District - Tanzania.
DATE AND TIME	:	2nd June, 1979. 1700hrs.

ALL TIMES IN THIS REPORT ARE GMT

SUMMARY

5H-TIM a Piper Aztec left Dar es Salaam at 0930hrs. on a Charter Flight to Tabora where it was to pick up passengers and return to Dar es Salaam the same day. The first leg was uneventful. During the return flight, the aircraft encountered bad weather. The Pilot could not fly IFR because of a faulty ADF in the aircraft, the aircraft was flown a low altitude to maintain VFR and in the process of avoiding storms, the Pilot got lost and could not make his way to Dar es Salaam.

The aircraft crashed in thick forest near Mgambo JKT Camp in Handeni District after all the fuel in the aircraft has been exhausted. All the five occupants were killed and there was no fire.

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FACTUAL INFORMATION

1.1 History of the Flight

Early on Saturday afternoon on 2nd June, 1979, aircraft 5H-TIM belonging to Tanzanian Air Services Limited departed Dar es Salaam International Airport at 0930 on a through VFR flight plan to Tabora and back to Dar es Salaam. The first leg was uneventful and the aircraft arrived at Tabora at 1220hrs. Throughout the first leg, two way radio communication was maintained with relevant Air Traffic Services Units.

Later, the aircraft departed Tabora airfield at 1236hrs. for Dar es Salaam with 5 people on board and fuel endurance of five hours.

Initially, the flight was estimated to take 2 hours 45 minutes to arrive in Dar es Salaam at 1525 hours. Two way radio communication was maintained with Tabora and the last contact was at 1240hrs, when the aircraft was cleared to contact Dar es Salaam Centre, on 118.9Mhz. Initial contact with Dar es Salaam Centre was established at 1301hrs. and the aircraft passed among other things that it was estimating Dar es Salaam at 1510hrs. and had fuel endurance of 0430. The current weather at Dar es Salaam was then passed on to the pilot.

At 1514hrs. Dar es Salaam Centre informed 5H-TIM that Dar es Salaam Control Zone was QBI, Instrument restricted and was advised to contact Dar es Salaam Approach on 119.1Mhz. for IFR Clearance. In acknowledging 5H-TIM revised his ETA to 1530hrs. The aircraft was then cleared to contact Dar Approach on 119.1 at 1515hrs.

5H-TIM did not establish contact with approach immediately. After several attempts, the worried Approach Controller managed to establish contact with the aircraft at 1526hrs. Then 5H-TIM again revised his ETA to 1540hrs.

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At this time, the visibility at Dar es Salaam was very poor. 5H-TIM was then cleared to the 'DM' FL 50, EAT 1536. This message was not acknowledged until it was relayed to TIM through another aircraft, because two way communication could not be maintained directly between 5H-TIM and Approach. Through the same means the pilot advised the Controller that although he was Instrument rated, he could not conform with the clearance as the aircraft's ADF was faulty. The Approach Controller then transferred the aircraft to Dar tower on 118.3 Mhz. From that time, no two way radio communication was established either between Dar Centre, Approach or Tower with the aircraft. However, efforts to communicate with 5H-TIM through other aircraft continued.

5H-TDF which was at that time flying from Dodoma to Dar es Salaam managed to establish contact with 5H-TIM at 1556hrs. on 118.3Mhz. 5H-TIM then reported that he was to the South of Dar es Salaam airfield maintaining 1500ft. on the QNH but was unable to know his exact location. Between 1600hrs. and 1610hrs, 5H-TDF advised Approach of 5H-TIM having reported to have the city in sight. But again the pilot when asked to indicate which part of the city he was at, no reply was received and there was no further communication until at 1618hrs. when contact was re-established with TC 444 a Boeing 737 on 118.3.

5H-TIM told TC 444 that he was not sure of his position. He further said that he was at an Altitude of 1000ft. in rain and was flying a heading of 310°M. He again reported that his ADF was not working. TC 444 tried to give all the assistance but still 5H-TIM could not ascertain his position. TC 444 even advised the pilot to climb higher and tune Radio Tanzania on 656Hz. At first the pilot reported that he could pick Radio Tanzania faintly but later he reported to have lost it.

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When requested the remaining fuel, the pilot reported that he had about 40 to 50 minutes. Suddenly 5H-TIM reported that he had Dar ss Salaam in sight. He was then advised to position for RWY 23 but later he said he had lost the city. From there on there was no further communication with 5H-TIM.

Immediately, after this situation, appropriate phases of emergency were initiated. The aircraft had left Tabora with full tanks and this was calculated to be exhausted at 1709hrs. After that the aircraft was considered to be in distress and a search operation was mounted.

1.1.1. Search and Rescue

The wreckage was sighted 13 days later in a thick forest near Mgambo JKT Camp in Handeni District.

Meanwhile on 2nd June, 1979, between 1630hrs. and 1700hrs., villagers at Genda Genda in Handeni District saw an aircraft flying very low in rain with landing lights on. Later they heard it crash in a nearby forest.

Although this information was passed to a nearby Police post, because of communication difficulties and negligence, news about 5H-TIM remained a mystery until 12th June, 1979 when word reached a Police helicopter pilot who had landed in Genda Genda village while carrying on the search.

From the above information, it is believed that the aircraft crashed at about 1700hrs. at night after running out of fuel. When the rescue team arrived at the crash site on 15th June, 1979, all the bodies were in advanced stage of decomposition. The aircraft was completely destroyed.

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Injuries to Persons

INJURIES	CREW	PASSENGERS	OTHERS
Fatal	1	4	-
Serious	-	-	-
Minor/None	-	-	-

1.2 Damage to Aircraft

The aircraft was completely destroyed by impact.

1.3 Other damage

Broken branches of trees.

1.4 Personnel Information

Born on 12th June, 1954, the pilot held a Commercial Pilot's Licence number HP-38 which was granted on 19th February, 1979. The licence was Instrument Rated and had Cessna 310 and Piper PA23 in group one. He also held a Radio Telephony Operators Licence which was kept current in line with the Commercial Licence. At the time of the accident the licence was current.

Experience

The experience at the time of accident is not known because his log book could not be traced. On 19th February, 1979, when his licence was issued he had a total experience of 268 hours 52 minutes broken down as follows:

DAY			NIGHT		
P1	P3	P1 (U/S)	P1	P3	(U/S)
185:35	59:30	4:35	07:05	10:40	1:30

1.5 Aircraft Information

A Piper PA23-250 Serial number 27-2920 powered by two Lycoming 10-540-C 4B5 engines was manufactured by Piper Aircraft Corporation, USA in 1965.

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The aircraft passed through many hands until it was finally registered under the Ownership of Tanzanian Air Services Limited. Between December 1976 and March 1978, the aircraft was grounded for about one year. At the time of the accident its Certificate of Airworthiness was valid and the aircraft had flown a total of 6787 hours 50 minutes of which 187 hours 35 minutes were flown since the last CofA renewal. The aircraft had been properly maintained in accordance with the approved maintenance schedule reference number MS/TAS/1/Issue 2 by Tanzanian Air Services Limited Check II was completed on 29th May, 1979.

1.5.1. Loading

The aircraft was loaded within the specified limits of the CofG envelope.

1.5.2. The type of fuel used by the aircraft was Avgas 100L.

1.6. Meteorological Information

Between 1500 hours to 1700 hours the weather at Dar es Salaam Airport was cloudy and hazy with visibility varying from 5Km to 1Km. At 1600hrs. the visibility improved to 20Kms. but still the rainy and cloudy condition persisted until 1700hrs. when the rain subsided.

Aerodrome forecasts for Dar es Salaam for practical purposes were the same as the actual weather condition stated above.

From the above, it will be noted that the weather around Dar es Salaam was very poor especially between 1500hrs and 1600hrs. the times when 5H-TIM was estimating Dar es Salaam.

The pilot did not request the route forecast, but reports from pilots who happened to be flying the route from Dodoma to Dar es Salaam indicate that the enroute weather was not any different from the Dar es Salaam weather.

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It was established that a few hours before the crash, the aircraft was flying at low altitude, in rain and at night. Weather is considered to be a contributory factor to this accident.

1.7. Aids to Navigation

At the time of the accident the Approach Radar at Dar es Salaam Airport was unserviceable, the VOR was radiating only on test basis. The Dar es Salaam VDF had been out of service for a long time and although the NDBs were in working order, the aircraft's only ADF was unserviceable leaving the Pilot with no Radio Navigation Aids.

1.8. Communication

The aircraft was fitted with normal two way radio station and the Pilot held a valid Radio Telephone Licence. After departing Tabora, 5H-TIM maintained two way communication with Tabora Tower until 1240hrs. after which time contact was established with Dar es Salaam Centre on 118.9Mhz. at 1301hrs. and normal communication was maintained until 1514hrs. when it was transferred to Dar es Salaam Approach on 119.1Mhz. After a period of silence of about ten minutes, Approach Control managed to establish contact with 5H-TIM on 119.1Mhz. and then IFR clearance which was not acknowledged was passed. From there on communication between 5H-TIM and ATS units was done by relaying through other aicraft.

The fact that 5H-TIM communicated with other aircraft indicates that the radio station in the aircraft was in good working condition and he could not pick or be picked by ATS units because he was flying at low altitude.

1.9. Aerodrome Information

Not applicable.

1.10. Flight Recorder

There was no requirement for this instrument to be fitted in the aircraft.

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1.11. Wreckage

The aircraft crashed in a very thick tropical forest. Examination of the crash site and the wreckage itself revealed that the aircraft started hitting trees which were about 15 metres high in a nose up altitude. The right hand tail plane was the first to be ripped off by trees followed by the rudder and the tail fin. This let loose all the baggage which was stowed in the rear baggage compartment. Clothes and other items from suite cases were found scattered and some were still hanging on trees.

The aircraft struck the ground in a nosedown altitude about 130 metres from the point of initial impact. It then slide downhill a further 20 metres where the left wing hit a tree trunck causing the aircraft to come to rest 180° to its original direction.

All the shettered bits of the aircraft were confined within a small radius of the main wreckage.

The situation in the flight deck was as under:-

Undercarriage Control	-	Up
Fuel	-	Off
Mixture	-	Lean
Propeller RPM	-	Idle position
Compass	-	Stuck on a heading of 240°
Altimeter	-	3850' set on 29.92" inches.

Unfortunately the ADF selection could not be ascertained.

1.12. Medical and Pathological Information

Post mortem reports of all the 5 occupants revealed no evidence of any medical condition which could be considered a contributory factor to the accident. All had died because of injuries received as a result of the accident.

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1.13. Fire

There was no fire.

1.14. Survival Aspects

The search for 5H-TIM was one of the longest searches ever carried out in Tanzania. It started on 2nd June, 1979, and ended on 13th June, 1979. Because of the remoteness of the crash site, the rescue team arrived there on 15th June, 1979, and all the bodies had already decomposed. The pilot's body including that of two other passengers were still trapped in the wreckage with their seat belts fastened. The other two bodies were thrown out of the aircraft on impact and were lying a few metres from the main wreckage. The aircraft crashed in a remote thick forest. This accident was not survivable.

1.15. Tests and Research

The wreckage was examined.

1.16. Additional Information

It has been mentioned earlier that the search for 5H-TIM was one of the longest ever carried out in Tanzania. However, reviewing the manner in which the search was carried out it leaves a lot to be desired.

Without going into more details one can say that lack of qualified and experienced personnel having no proper search procedure and a breakdown in communication especially within the Police network all contributed to a lengthy search.

2. ANALYSIS

5H-TIM had left Tabora for Dar es Salaam on Saturday afternoon of 2nd June, 1979 at 1220hrs. with five people on board.

At take-off the endurance was 0400hrs. During the early stages of the flight everything went on well.

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After a brief contact with Tabora, the aircraft was transferred to Dar es Salaam Centre.

Contact with Centre was established at 1301hrs. and the pilot gave his ETA Dar es Salaam as 1510hrs. Then current weather which at that time was moderate rain with visibility down to 800metres and cloud conditions of 4 Cu 200, 6AS 800 were passed to the Pilot.

There was no other communication between Dar es Salaam Centre and the aircraft until 1514hrs. when Centre advised the aircraft to remain outside the control zone until 1540hrs. because the weather was QBI and other aircraft were making Instrument Approaches. Then the aircraft was transferred to contact Dar es Salaam Approach on 119.1Mhz. 5H-TIM acknowledged the message and revised his ETA to 1530hrs.

There was a period of silence until Approach managed to contact the aircraft at 1526hrs; even then, the Pilot could only read the controller faintly. Again he revised his ETA to 1540hrs. Two way communication became difficult and from then on all other contacts were made by relaying through other aircraft which happened to be flying in the vicinity.

The Pilot was then cleared to 'DM', FL 50 EAT 1536. Although the pilot confirmed that he was Instrument Rated, he reported that because of a faulty ADF in the aircraft he could not comply with the clearance.

The Controller had no alternative clearance to offer. Apart from 'DM' NDB all other radio navigational aids at Dar es Salaam Airport were unserviceable. These included the VOR, radar, ILS and the VDF. He therefore advised the aircraft to contact Dar es Salaam Tower on 118.3Mhz.,

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The aircraft never contacted Tower. For sometime 5H-TIM had encountered bad weather enroute. He could not fly IFR because of a faulty ADF. He was flying low level to comply with VFR at the same time diverting from the planned track to avoid stormy areas. In this process, the Pilot got lost. Another aircraft 5H-TDF managed to establish contact with 5H-TIM at 1556, and when the Pilot was asked to indicate his position, he replied that he was somewhere to the South of Dar es Salaam, flying at 1500ft. and unable to tell his exact position. From this, and the fact that there were many ETA revisions, it indicates that the Pilot had been lost for a long time only that he could not disclose this in good time. Actually the aircraft was still far from Dar es Salaam flying at low level. That is why VHF communication with Dar es Salaam Approach and Tower had been difficult to achieve.

As time passed things were getting worse for the Pilot. While he was still to re-track himself to Dar es Salaam, bad weather was still with him and night was approaching fast. The fuel was also getting finished. Such circumstance were too much for a young man who had just started his carrier as a Pilot. He had little experience in flying at night. The result of this was that the aircraft continued flying in search of Dar until it ran out of fuel and crashed in the forest.

3. CONCLUSION

a) Findings

i) The Pilot was properly licensed to fly the aircraft.

ii) The aircraft had a valid CofA.

iii) The weather condition enroute was very poor low clouds accompanied by rain and thunderstorms.

iv) The Pilot was unable to fly IFR because the aircraft ADF was unserviceable. It could not be determined whether the equipment was faulty before the aircraft

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took off or if the fault developed when the aircraft was airborne.

v) Almost all ground radio navigational aids were unserviceable at Dar es Salaam Airport. Only 'DM' NDB was serviceable.

vi) The aircraft crashed after the engine had ceased because of lack of fuel.

vii) All the five occupants were killed and the aircraft was completely destroyed. There was no fire in this accident.

4. CAUSES

The accident was caused by the aircraft striking the trees in the forest after the Pilot had lost his bearing and ran out of fuel.

Contributory to the accident were:-

1) Bad weather enroute.

2) Defective ADF.

3) Lack of adequate ground Radio Navigational Aids.

4) Poor airmanship on the part of the Pilot.

5. SAFETY RECOMMENDATIONS

1) Pilots should avoid flying in bad weather when their aircraft are not properly equipped for IFR flight plans.

2) The Directorate of Civil Aviation should make efforts to improve the serviceability of radio navigational aids in the country.

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3) It is recommended that all aircraft be fitted with the Emergency Locator Beacon.

4) The Directorate of Civil Aviation should consider seriously improving the communication facilities among various Search and Rescue agencies.

(A.L. Mohamed)
INSPECTOR OF ACCIDENT

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