

(canyon) between two steep hills overlooking the camp. There were no communications between the aircraft and the Dar es Salaam Area Control Centre. The aircraft was not equipped with HF radio.

The Bulletin contains facts relating to the accident which have been determined up to the time of issue. This information is published to inform the public and the aviation industry of the general circumstance of the accident at the preliminary/stage and must necessarily be regarded as tentative and subject to alteration or correction if additional evidence becomes available.

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When the aircraft failed to arrive at Katavi the operator contacted a number of airstrips on the aircraft flight path to no avail. A search and rescue operation involving four aircraft was then initiated. At 1830 hours on that day one of the search planes, a Cessna182 registration 5H-ZGF, spotted smoke coming out of a valley between two hills along the Lubulungu River. Further flights around the area established the presence of white pieces on the side of a hill, indicating the possibility of wreckage in that area. On the following day, 17 October 2005, smoke was no longer visible. However, ground search parties, with help of spotter planes and markers, were able to spot the wreckage at 1530 hours (1830 hours local time). They were not able to access the site at the time due to night fall and the rugged terrain.

The ground parties eventually arrived at the crash site at 0520 hours (0720 hours local time). They ascertained that it was indeed the crash site and that there were no survivors.

EXAMINATION OF THE WRECKAGE

The AIB inspectors arrived at the crash site on 19 October 2005. The wreckage was found on the slope of a steep, thickly wooded hill. Much of the remains of the aircraft was together at one place and extensively burned. This would rule out the possibility of an in flight break up. A large area of vegetation around the crash site was also burned.

There were some parts of the aircraft, which had separated in the accident sequence and were found close to the wreckage. These were the left horizontal stabilizer, part of the baggage

pod, the engine, and the propeller. The bodies of the occupants were all found in the wreckage, burnt beyond recognition.

The propeller

The propeller was found resting on a rock just below the point of the main impact. It was not possible to access the propeller due to hostile terrain. All the blades were still on the hub. One of the three blades was directly visible and was bent. It showed no direct signs of power at impact with the terrain.

However, when the propeller was recovered from its resting position on 17 November 2005, the remaining two blades had power signatures.

The engine

The engine, a Teledyne Continental IO-520F73B, Serial Number 830515-R was re-manufactured by Teledyne Continental Motors Inc, in April 2005. It arrived in East Africa with an export C of A number E396646 dated 28 April 2005. By the time of the accident the engine had done 327 hours.

The engine was examined at the crash site. It had suffered both impact and fire damage. The crank shaft was broken at the forward end. A portion of the crank shaft flange which separated was retrieved for laboratory analysis.

This piece was examined at the Materials and Process Laboratory of Teledyne Continental Motors at Mobile, Alabama in the presence of the IIC. The laboratory tests established that:

- 1) The surface hardness met the print requirements.
- 2) The crankshaft propeller flange was fractured in overload.
- 3) There was no evidence of fatigue on any fracture surface.

There was shallow cracking across the front face of the flange. These cracks are typical of a propeller strike.

The oil filter was externally burnt. It was recovered from the wreckage and was cut for examination in a workshop. There were no signs of any metal particles inside the filter.

The oil sump was opened and examined at the crash site. There was burnt oil inside the sump.

There was no evidence of engine failure in flight. The available evidence points to sudden stoppage at the time of impact.

THE FUSELAGE

Much of the fuselage suffered impact and fire damage. From the marks on a tree on the crash site, it was evident that the left wing and horizontal stabilizer had collided with the tree, possibly deflecting the aircraft from its original track subsequent to which it collided with a rock on the hill side.

It was not possible to determine the exact configuration of the aircraft at the time of impact because of its near complete destruction. 5H-APE did not carry any flight recorders.

The Fuel Selector,

The fuel selector sustained external fire damage. It was opened at the operator's maintenance organization workshop. The positions of the valves were photographed and the pictures were sent to the manufacturer for determination of the selected position at the time of the accident.

The manufacturer has since determined the fuel selector position at the time of the accident as being on the LEFT tank.

The Flap Actuator

Examination of the flap actuator showed that it did not exhibit any threads. This position, according to Cessna, indicates that the flaps were in the UP position at the time of impact.

The Elevator trim tab

Measurements on the elevator trim tab control mechanism screw showed that the last 1.75 inches of the thread length was damaged as a result of impact. According to the manufacturer, this equates to 10 degrees tab UP.

The wind shield

Pieces of the wind shield (wind screen) were examined at the crash site. There were no signs of breaking under localized impact load before the aircraft collided with the terrain. The question of bird strike was therefore ruled out.

THE GPS

The GPS, a GARMIN **GPS III PLUS**, Serial No. 96529073, was found outside the wreckage near the right wing. Damage to this equipment was confined to the antenna. Part of the antenna sheared off on impact. The unit had no evidence of fire damage.

The GPS was sent to the manufacturer for memory readout. The readout was made under the supervision of a United States FAA inspector.

There were 7 tracks retrieved (from the last 7 flights) which also include the accident flight. The track shows a departure from Mahale Airstrip, down to the Operator's Camp. It made a pass over the camp, then circled once after which it headed for the valley. The air speed at the beginning of the climb is 100 knots and then begins gradually to drop down to 90 then 80 then 60 knots. The last two points indicate a left turn with airspeed at 34 knots.

THE CRASH SITE

The aircraft came down in a valley between two steep and thickly wooded hills which form the banks of the Lubulungu River in the Mahale Mountains. A valley of this type is sometimes called a canyon. The vegetation is mainly tropical rain forests with heavy under growth. There are also some rocks and loose stones scattered on the banks of the river. This terrain makes access to the crash site particularly difficult.

The crash site is 4.5 km east of the Lake Tanganyika and 7.5 km along the river in the Lubulungu hills. It is also about 18 km south of Mahale Airstrip. The elevation of the crash site is 4034 feet¹ (1229 metres).

THE WEATHER

It was a bright sunny day with the temperature estimated at about 28 degrees Celsius. The weather does not appear to have had any direct bearing on this accident.

FURTHER WORK

Further investigations into the causes of this accident are in progress.