

CAV/ACC/42/68

ACCIDENT INVESTIGATION BRANCH

CIVIL AIRCRAFT ACCIDENT

Report on the accident to Cessna-182L
Aircraft Registration Number 5H-MOA
which occurred on 30th November,
1968 at Kingupira Aerodrome
in the Selous Game Reserve,
Tanzania.

EAST AFRICAN COMMUNITY

ACCIDENT REPORT
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Civil Aircraft Accident Report No. CAV/ACC/42/68

AIRCRAFT: Cessna 182L 5H-MOA. ENGINE: Continental
O-470-R.

REGISTERED OWNER Game Division, P.O. Box 1994, DAR ES SALAAM.
AND OPERATOR :

PILOT: G. A. Hamilton - uninjured

PASSENGERS: Miss J. M. Honey - uninjured
Mr. I. M. Evans - uninjured

PLACE OF ACCIDENT: Kingupira Aerodrome, Selous Game Reserve,
Tanzania.

DATE AND TIME: 30th November, 1968 at approximately 1330 hours.

ALL TIMES IN THIS REPORT ARE GMT

S U M M A R Y

The airspeed indicator apparently failed to function during take-off and the pilot abandoned the take-off. The aircraft overran the landing area and turned over. No injuries were sustained by pilot or passengers.

1. INVESTIGATION

1.1 History of the Flight

On 30th November, 1968 the pilot, Mr. G.A. Hamilton, arranged an official flight to convey two passengers and a Caterpillar Tractor D 12 fuel tank from Dar es Salaam to Kingupira Aerodrome.

To accommodate the fuel tank, the two rear seats of the aircraft were removed. One passenger occupied the seat adjacent to the pilot and the other sat on the floor behind the pilot, holding the fuel tank in position. This passenger was not occupying a seat and was not strapped in, and the fuel tank, which the pilot estimated as weighing some 300 lbs, was not secured in any way to the airframe structure.

The aircraft departed Dar es Salaam at 1145 hours and arrived safely at Kingupira at approximately 1300 hours when the fuel tank was off-loaded.

At approximately 1330 hours, a rainstorm which had been centred over the aerodrome passed over and the two passengers re-entered the aircraft for the return journey to Dar es Salaam. Seating arrangements were the same as for the inbound flight, with one passenger sitting behind the pilot's seat holding on to the two front seats with his feet braced against the seat structure.

Take-off was commenced from a point which left slightly less than 600 yards for the departure run in order to avoid a patch of soft, muddy ground some 10 yards in length across the width of the runway.

After a run of some 200 yards, the pilot observed that the airspeed indicator was not registering and gently tapped the instrument to check if the needle was stuck. When no indication was then observed, the take-off was abandoned with slightly less than 300 yards of runway remaining. The throttle was closed and the brakes applied.

The aircraft continued in a straight line until the pilot realised he would be unable to stop in the distance remaining, when he attempted to steer the aircraft clear of some mounds of loose earth. Nose wheel steering and braking were ineffective on the wet surface and the aircraft slid sideways off the end of the strip and turned over. The aircraft was substantially damaged.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	-	-	-
None-fatal	-	-	-
None	1	2	-

1.3 Damage to aircraft

Substantial.

1.4 Other damage

None.

1.5 Crew Information

The pilot, Mr. G. A. Hamilton, aged 26 years, holds a Canadian Commercial Pilot's Licence No. YZC 9169 and Radiotelephony Licence 4-7452 issued on 1st December, 1966 and currently valid until the 6th December, 1969. The Licence is valid for single and multi-engined land planes and seaplanes up to 12,500 lbs gross weight. His total flying experience at the time of the accident was 752 hours, of which 643 hours were as pilot in charge and 136 hours on the Cessna 182.

1.6 Airworthiness

The aircraft, a Cessna 182L, serial No. 18259283 powered by a Continental O-470-R engine was constructed by the Cessna Aircraft Company, Wichita, U.S.A. in 1968. It arrived in East Africa in possession of FAA Certificate of Airworthiness for Export No. E-88276. The aircraft was certificated onto the East African Register on 30th October, 1968, and the Certificate of Airworthiness is valid until 30th October, 1969. The aircraft and engine had completed 191 hours since new at the time of the accident.

The maximum permitted all-up weight of the aircraft is 2800 lbs and the basic weight is 1743.5 lbs. With main tanks full on departure from Dar es Salaam, there are strong grounds for believing that the aircraft was over-weight on departure to Kingupira.

	lbs
Basic weight	1743.5
Petrol (full tanks)	475
Pilot (average weight)	165
Passenger (male) (average weight)	165
Passenger female (average weight)	115
Caterpillar fuel tank (pilot estimate)	<u>300</u>
TOTAL	2963.5
Permissible maximum all-up weight	<u>2800.0</u>
Calculated overweight	163.5 lbs

1.7 Meteorological Information

The weather conditions were not a contributory factor apart from the rain shower which affected the aerodrome surface prior to take-off.

1.8 Aids to navigation

Not applicable.

1.9 Communications

Not applicable.

1.10 Aerodrome and Ground facilities

The Aerodrome is owned and operated by the Game Division of Tanzania and has a usable length of approximately 1000 yards. The surface is of black cotton soil with a covering, over most of its length of loose sand.

Approaches to the runways are good. No wind sleeve is available to determine wind speed and direction.

The surface is susceptible to becoming soft with a marked deterioration in braking action following even a small fall of precipitation.

1.11 Flight Recorders

Not fitted.

1.12 The Wreckage

The aircraft was lying in an inverted position on the south eastern end of the aerodrome with damage amounting to a complete write-off. No evidence was found to indicate any pre-crash failure.

1.13 Fire

No fire occurred.

1.14 Survival aspects

The aircraft appears to have overturned quite gently and this appears to have been the only factor which enabled the pilot and passengers to escape without injury.

The pilot and one passenger were strapped in securely during both take-offs, but the other passenger did not occupy a seat and was not secured in any way to the aeroplane structure.

Had the aircraft overturned or even suffered a nosowheel failure on take-off from Dar es Salaam, or on landing at Kingupira, it is extremely doubtful whether there would have been any survivors. The weight of a 300 lb. tank being flung around an enclosed cabin would have created a situation which could have damaged both aircraft and passengers severely.

Even when the fuel tank had been unloaded, a potentially dangerous situation existed in that one passenger would never have been able to hold on had the aircraft overturned at any speed. The centrifugal force of turning over at any speed would have thrown this passenger around the cabin.

1.15 Test and Research

The pitot head and static line were checked for blockage and were found to be completely clear.

The theory put forward by the pilot that the pitot head had filled with water was examined, and discarded as the pitot head is located underneath the mainplane and the drainage hole was found to be clear.

2 ANALYSIS AND CONCLUSIONS

2.1 Analysis

The examination of the wreckage failed to reveal any reason for the malfunction of the airspeed indicator. It may have been caused by an insect becoming lodged in the pitot head aperture which became dislodged during the crash.

The conduct of the flight up to the time of the accident left a great deal to be desired, and was not the conduct expected from a Commercial Pilot of considerable experience.

The aircraft would appear to have been overloaded on departure from Dar es Salaam, one passenger and a fuel tank were occupying the cabin floor behind the pilots' seat and were not secured.

Departure from Kingupira was attempted in 600 yards, when it would have been prudent to use the whole available length of the runway. The soft, muddy patch should in no way have hampered the take-off, as the aircraft should easily have been airborne in the 400 yards before the soft ground, thus leaving the 600 yards for the climb out or emergency stop if it became necessary.

The loss of airspeed indication should have presented no problem to a pilot with over 700 hours experience, and the take-off should never have been abandoned, especially in the available runway distance remaining in which to stop.

2.2 Conclusions

1. The aircraft documentation was in order;
2. the pilot was properly licensed for the flight;
3. the aircraft was loaded, at the time of the crash, within the centre of gravity limits;
4. there had been no pre-crash failure of the aircraft or its engine. A temporary blockage of the pitot head may have occurred;
5. one passenger was not occupying a seat and was not strapped in;
6. the rain shower affected the braking action of the runway to such an extent that it would have been impossible to bring an aircraft which was approaching take-off speed to a halt in the distance remaining;
7. the wheel spats were full of dried black cotton soil which effectively blocked the wheel rotation.

2.3 Cause

The Accident was in all probability caused by the failure of the pilot to use the full length of runway available, by aborting the take-off when insufficient runway remained, and by a complete lack of appreciation of the effects of a fall of rain on a black cotton soil surface.

2.4 Recommendation

Aircraft which are intended to be used frequently from unprepared aerodromes, should have the wheel spats removed to prevent their becoming clogged with mud and grass which can seriously affect wheel braking or steering.

The pilot should be admonished for his lack of airmanship, especially in view of the non-securing of the load and for carrying a passenger for which there was no seat.



R. Allen.
INSPECTOR OF ACCIDENTS

RA/MWT