CAV/ACC/24/75

ACCIDENT INVESTIGATION BRANCH

CIVIL AIRCRAFT ACCIDENT

Report on the Accident to Douglas DC-3
Aircraft Registration Number 5Y-AAF
which occurred on the 27th August, 1975
At 0922 hours, at Mtwara Airport,
Tanzania.

E A S T A F R I C A N C O M M U N I T Y

ACCIDENT REPORT

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CIVIL ACCIDENT REPORT CAV/ACC/24/75

AIRCRAFT TYPE & REGISTRATION:		Douglas DC-3 5Y-AAF
ENGINE:		Pratt & Whitney R1830-90D
REGISTERED OWNER & OPERATOR:		East African Airways Corporation, P.O. Box 19002, NAIROBI, Kenya.
CREW:	CAPTAIN	Gabriel Sebastian Turuka } Uninjured
	FIRST OFFICER	Steven Robert Wegoye }
PASSENGER:		Sixteen - Uninjured.
PLACE OF ACCIDENT:		Mtwara Airport, Tanzania.
DATE AND TIME:		27th August, 1975, 0922 hours.

ALL TIMES IN THIS REPORT ARE G.M.T.

S U M M A R Y

The aircraft was operating East African Airways Service flight number EC087 from Dar es Salaam to Nachingmea with an unscheduled refuelling stop at Mtwara with 3 crew and 16 passengers on board. The flight from Dar es Salaam was uneventful and an approach and landing was made onto runway 19. After touch down the aircraft swung to the left and then to the right, after which it left the runway where both main landing gear assys collapsed causing substantial damage to the centre section and nacelle structure.

The report concludes that the most probable cause of the accident was the failure of the pilot to initiate corrective action to prevent the aircraft from turning off the runway.

1.1 HISTORY OF THE FLIGHT:

The aircraft departed Dar es Salaam with three crew and 16 passengers. Flight No. EC.087 was scheduled to call at Lindi and Nachingwea with the service terminating at Nachingwea. Due to the non availability of fuel at Dar es Salaam, the aircraft made an unscheduled stop at Mtwara to refuel with sufficient fuel for the return service EC.088 to Dar es Salaam.

The weather at Mtwara was reported fine with the wind light and variable. At the time of the landing, the wind direction was given as 030° and 8 knots.

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The aircraft made the approach and landing using standard procedures, and touched down at a point some 1000 feet from the threshold of runway 19. After a ground roll of 150 feet, the aircraft commenced a swing to the left side of the runway, it then rolled another 350 feet and swung to the right, continued on this course, leaving the runway and skidding for approximately 180 feet before it came to rest having turned 135° from the direction of the landing.

Both landing gear assys collapsed due to excessive side loads applied to the structure, substantial damage was caused to the centre section structure and nacelles. The port propeller was damaged. The passengers and crew were able to evacuate the aircraft with the aid of the ground rescue services. Two passengers were taken to hospital and treated for shock.

1.2. INJURIES TO PERSONS:

Injuries	Crew	Passengers	Others
Fatal	-	-	-
Non-fatal	-	-	-
None	3	16	-

1.3. DAMAGE TO AIRCRAFT:

The damage was confined to the area of the centre section:-

1. Centre Section Structure - Substantially damaged
2. Port and starboard nacelles - damaged
3. Main landing gear - Substantially damaged
4. Port Propeller - damaged.

1.4. OTHER DAMAGE:

No other damage.

Crew Information.

Pilot: Captain G.S. Turuka, born on 23rd March, 1943, holds an East African Airline Transport Pilot's Licence No.1497 (K.1136) issued on 23rd July, 1974. This Licence has been kept current until the present validity period which expires on 19th January, 1976. He also holds a Radio Telephony Licence No.1484 (K.1028) dated 5th December. 1967, and kept current in line with the ALTF. The ALTP is rated for Piper PA.28, Douglas DC3 and DC9 in Group 1. Fokker F.27 and DHC-6 in Group 11.

Experience: On the application for renewal of his licence dated 16th July, 1975, he claimed a total flying experience of 2884.30 hours, made up as follows:-

	DAY	NIGHT
Pilot in command	855.60	176.10
Second Pilot	1590.15	262.45

CO-Pilot: First Officer S.R. Wegoye, born on 22nd January, 1954, holds an East African Commerical Pilot's Licence No.1577 (K.1414) issued on 4th March, 1975, and rated for Cessna 150 in Group 1 and Douglas DC-3 in Group 11. At the time of the accident, his licence was valid until 3rd September, 1976. He also holds Radio Telephony Licence No. (X64) dated 22nd November, 1973, and kept current in line with his CPL.

Experience: On the application for renewal of his licence dated 2nd September, 1975, he claimed a total flying experience of 411.50 hours, made up as follows:-

	DAY	NIGHT
Pilot in command	194.45	8.25
Second Pilot	205.15	3.25

1.6. AIRCRAFT INFORMATION:

5Y-AAF a Douglas DC-3 Serial No.16577/33325 powered by two Pratt & Whitney Twin Wasp R-1830-90D engines was manufactured by Douglas Aircraft Company, Santa Monica, California, U.S.A. in 1944.

The aircraft arrived in East Africa with a Certificate of Airworthiness No.A.3645 issued by the Ministry of Civil Aviation, United Kingdom, dated 15th August, 1952. An East African Certificate of Airworthiness No.95 valid until 14th October, 1952 was issued on 21st August, 1952. This Certificate had been currently renewed until 21st May, 1975, but had not been renewed for the current period due to the Radio Station Survey Report not being submitted.

MAINTENANCE HISTORY:

The aircraft was operated by East African Airways Corporation on regional air services within East Africa. It had been maintained to their Approved Maintenance Schedule Ref:EAAC/C47 and all maintenance required by this schedule had been complied with.

At the time of the accident, the following hours had been recorded:-

Airframe total hours since manufacture		37,365.35
" " " last overhaul		3,147.65
" " " " Check 5		3,147.65
" " " " " 4		1,459.80
" " " " " 3		469.45
" " " " " 2		47.00
" " " " " 1		47.00
Engine Port S/N CP 30212	" Manufacfure	Not known
" " "	" Overhaul	988.05
" Stbd " 488748	" Manufacture	18,980.45
" " " ""	" Overhaul	407.05
Propeller Port S/N FB 6132	" Manufacture	Not known
" " " "	" Overhaul	656.00
" Stbd S/N F 4557	" Manufacture	32,996.75
" " " ""	" Overhaul	858.80

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All Federal Aviation Administration Airworthiness Directives and Civil Aviation Authority Mandatory Aircraft Modifications and Inspections applicable to the aircraft, its engines, propeller and equipment had been complied with. In addition, applicable East African DCA notices had been complied with.

1.7. METEOROLOGICAL INFORMATION:

The weather at the time of the accident was reported as very good visibility with a light surface wind at 8 knots from 030°.

1.8. AIDS TO NAVIGATION:

Not applicable.

1.9. COMMUNICATIONS:

Not applicable.

1.10. AERODROME AND GROUND FACILITIES:

Mtwara airfield is situated 3.5 nautical miles south west of the town at an elevation of 370 feet AMSL. The main runway 01/19 has an asphalt surface 7335 feet long by 97 feet wide. The other runway 08/26 has a murram surface 3763 feet long by 97 feet wide with landing and take-off in both directions.

1.11. FLIGHT RECORDER:

Not applicable. The aircraft was not required to be fitted with a flight data recorder.

1.12. Wreckage:

The aircraft remained substantially intact when it came to rest at the side of the runway. Both main landing gear assemblies had collapsed and were folded under the centre section.

1.13. FIRE:

Fire did not occur.

1.14. SURVIVAL ASPECTS:

The crew and passengers survived the accident without injury. The aircraft swung off the runway soon after touch down at 70 knots, the passengers and cabin staff were secured in their seats with lap straps. Various pieces of hand luggage and cabin service equipment were scattered about the cabin without injury to any of the occupants. Two passengers were treated for shock in hospital.

1.15. TESTS AND RESEARCH:

Examination of the aircraft at the accident site revealed no precrash mechanical or structural failure. The main wheel and brake assemblies were removed for detailed workshop examination, and no defects were found in these assemblies. The damage to the port tyre was consistent with the high side loads sustained by the landing gear structure. The tail strut assembly complete with fork and wheel was removed for detailed workshop examination.

No damage had been sustained by this unit and no defects were apparent. Particular attention was paid to the tail wheel lock mechanism which was also undamaged and no defects apparent.

The wheel tracks on the runway were closely examined from the point where the aircraft started to swing to the left up to where it came to rest.

As the aircraft started to swing to the left, there was evidence of braking for a distance of 660 feet. The port wheel braking intermittently and the starboard wheeel track showing fairly heavy braking. At this point, the port main wheel had left the runway and was rolling on the hard shoulder. For the next 300 feet there were signs of scuffing of the surface of the hard shoulder caused by braking and a drift to the left. The aircraft by this time had commenced a swing to the right. Super-imposed on the port main wheel track were the marks of the tail wheel which showed that this unit was shimmying at that moment. The tail wheel shimmy marks extended for 400 feet.unitl they met with the asphalt surface of the runway.

During this period, the starboard wheel marks indicated heavy braking and skidding. For the next 230 feet the starboard wheel track showed heavy braking and skidding until it entered onto the right hand shoulder, the port wheel track showed intermittent braking. The aircraft now left the runway at an angle of approximately 45° and still turning. The port wheel showed heavy drift to port as it was rolling across the hard shoulder and into the bush for a distance of 150 feet. The starboard wheel mark indicated heavy braking, skidding and drift, at one stage it appeared that the wheel had left the ground for a short distance. There were also indications of the brake being released on two occasions for short distances. Finally, the aircraft entered into a severe drift to port and appeared to have tipped or bounced some 15 to 20 feet after which the landing gear collapsed.

As a result of the final impact when the aircraft came to rest, the three emergency lights situated in the roof were tripped.

TAIL WHEEL LOCK:

Investigation revealed that the control lever had been placed in the locked position and the lock mechanism of the tail wheel strut was engaged.

A test flight after port engine change carried out on the morning of the day of the accident was satisfactory, the aircraft maintenance log No.96791 was endorsed NIL in the Aircraft Defects column.

1.16. MEDICAL ASPECTS:

Not applicable.

2.1. ANALYSIS:

2.1.1. FACTORS LEADING TO THE ACCIDENT:

From the evidence available, it would appear that (a) the aircraft was serviceable and airworthy when the pilot accepted the aircraft to operate service EC 087, (b) the brakes were serviceable and operating after the aircraft touched down at Mtwara Airfield.

The aircraft made an approach on runway 19 with an 8 knot wind blowing from 030° which may have influenced the initial swing to port.

The swing to port commenced soon after touch down at a speed where corrective action by the rudder combined with appropriate braking action should have corrected the initial swing.

From the examination of the tracks made by the wheels, it is evident that sufficient braking action was never applied to the port wheel in order to attempt to correct the swing to starboard.

Excessive tail wheel shimmy marks superimposed on the port main wheel tracks would indicate that the tail wheel lock was not engaged at that moment.

LOADING:

The gross weight and centre of gravity index on departure from Dar es Salaam were stated to be 11,893 kgs. with an index of + 1.7. and the landing weight at Mtwara was given as 11,507 kgs. Max Take-Off weight authorised from Dar es Salaam on the particular day was given as 12,587 kgs.

2.2. CONCLUSIONS:

2.2.1. FINDINGS:

(1) At the time of the accident, the Certificate of Airworthiness had not been renewed. The Airworthiness Division of the DCA had made a suitable recommendation for renewal, but the radio survey report had not been submitted, which prevented the document from being endorsed.

(2) The aircraft had been properly maintained.

(3) The crew were properly licenced.

(4) The aircraft weight and centre of gravity were within the prescribed limits.

(5) The aircraft brake system was found to be serviceable and functioning after the accident.

(6) The aircraft swung first to the left and then to the right soon after touchdown. After the swing to the right, the aircraft went off the runway into the bush.

2.2.2. CAUSE:

The most probable cause of the accident was the failure of the pilot to initiate corrective action to prevent the aircraft from turning off the runway.

(K.R. GRANT)
INSPECTOR OF ACCIDENTS

KRG/JAO