

Cessna 404 Titan, PT-WQT

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| AAIB Bulletin No: 10/2004 | Ref: EW/G2004/05/22 | Category: 1.2 |
| Aircraft Type and Registration: | Cessna 404 Titan, PT-WQT | |
| No & Type of Engines: | 2 Continental Motors GT SIO-520M piston engines | |
| Year of Manufacture: | 1977 | |
| Date & Time (UTC): | 29 May 2004 at 1921 hrs (1521 hrs local) | |
| Location: | Stanley Airport, Stanley, Falkland Islands | |
| Type of Flight: | Aerial Work | |
| Persons on Board: | Crew - 2 | Passengers - None |
| Injuries: | Crew - None | Passengers - N/A |
| Nature of Damage: | Damage to propellers, engines and nose landing gear | |
| Commander's Licence: | Brazilian Commercial Pilot's Licence | |
| Commander's Age: | 41 years | |
| Commander's Flying Experience: | 4,924 hours (of which 305 were on type) | |
| | Last 90 days - 110 hours | |
| | Last 28 days - 70 hours | |
| Information Source: | Aircraft Accident Report Form plus a comprehensive file of statements and data compiled by the Civil Aviation Department of the Falkland Island Government | |

Background

This flight was part of a programme of survey work being performed over the Falkland Islands by a Brazilian survey company and the previous flights had been uneventful. The crew normally comprised two pilots and a survey systems operator but on this occasion, due to a changeover of personnel, there was one pilot and the systems operator. The commander's experience in the Falkland Islands was 70 hours in 17 flights, of which he had been pilot-in-command for 23 hours (5 flights).

History of the flight

The commander and systems operator had both participated in a survey flight of 2 hours 45 minutes earlier in the day, also from Stanley Airport and operating as a normal crew of three. There was then

a break of 35 minutes on the ground, during which the commander inspected the exterior of the aircraft and supervised its refuelling with sufficient fuel for a further three hours. The aircraft took off at 1630 hrs UTC (1230 hrs local) for a survey flight over West Falkland with a crew of two, the systems operator and the commander, who had acted as co-pilot on the previous flight.

Returning to Stanley from the survey flight about 2 hours 30 minutes later, and 10 minutes before landing, the commander contacted the control tower and received information about the weather conditions, including the snow showers moving to the north-west. The wind conditions were given as from 200° at 20 kt, gusting to 28 kt. The commander joined the left-hand circuit on the downwind leg for Runway 27 and before landing he was given further wind readings of 190°/20 to 25 kt and 200°/20 to 25 kt. He reduced speed abeam the threshold to 120 kt, selected approach flap and lowered the landing gear. On finals, with the approach stabilised, he selected landing flap and maintained runway alignment in the strong crosswind with the left wing lowered and right rudder pedal.

The commander recalls crossing the threshold in a normal and stabilised attitude at 105 kt. At touch down the left main wheel contacted first, followed by the right main wheel and nose wheel and the commander maintained aileron control to the left to keep load on the left wheel. With the aircraft fully on the runway the commander released back pressure on the elevator and brought the power levers back to idle but then realised the nose was turning to the right of the runway. He attempted to apply a small correction using left pedal but the aircraft did not seem to respond. The commander then felt a shock in the right pedal and the aircraft started to turn to the left. He tried to maintain alignment with normal pedal movements but needed to use greater amplitude on the pedals. With the nose gear not responding to his steering inputs and the aircraft slowing, the commander started to apply the brakes. He felt the aircraft nose go down so he pulled the control yoke backwards but there was not time to shut down the engines and prevent the propellers from striking the ground while rotating. The aircraft came to a halt near the runway centreline and the commander and the systems operator were able to exit safely.

From the control tower the landing had appeared successful but the aircraft appeared to swerve slightly and the nose landing gear collapsed at about 40 kt. The aircraft then slid down the runway in a straight line on its nose and main wheels. The Airport Fire Service was deployed immediately and reported that there no apparent injuries to the two crewmembers, there was no fire risk and no fuel had spilled from the aircraft.

Examination

Examination of the aircraft after the accident confirmed structural failure of the forward attachments of the nose landing gear and that this was consistent with overload conditions rather than any existing damage. All six propeller blades had been damaged by contact with the runway while rotating and the flaps were in the fully extended landing position.

The marks on the runway matched the accounts both from the crew of PT-WQT and the numerous eyewitnesses. Rubber marks from the nosewheel tyre started 180 metres from the threshold of Runway 27 and the propeller strike marks started 8 metres further on. The marks caused by the airframe continued with surface abrasions made by metal components around the nose leg and the aircraft came to a halt 306 metres from the runway threshold.

Weather

The various witness accounts of the wind conditions were consistent, with a substantial crosswind, generally from 200° at 20 kt, gusting between 25 and 28 kt. At 1840 hrs UTC (1440 hrs local) the cloud was 'broken' at 2,000 feet and visibility was 25 km. Barometric pressure was rising and surface temperature was +1°C.

Some witnesses, including the commander, described patches of snow and ice on the runway. Photographs of the aircraft and runway taken shortly after the accident support this, showing some small patches of ice and some areas with a very light covering of blown snow.

Analysis

The landing was performed with a crosswind component, according to the weather observations, of between 16 and 19 kt. The commander later commented that he considered that the condition of the runway may have played a part in the initial swing of the nose, which he attempted to correct but without an immediate effect. At this point he would have tended to apply more pedal movement, deflecting both the rudder and the nosewheel. If the nosewheel, in a deflected position and having low adhesion, then encountered a dry and rough section of the runway surface, the tyre deflection would have caused substantial loads in the nose leg structure, additional to those from the crosswind conditions. This would be a reasonable explanation for the structural failure of the nose leg.