

LOCATION OF OCCURRENCE

Two miles south east of Gove Aerodrome, N.T.	Height a.m.s.l. (ft) 246 feet	Date 22, 12, 69	Time (Local) 1257	Zone CST
--	----------------------------------	--------------------	----------------------	-------------

2. THE AIRCRAFT

Make and Model Cessna 402	Registration VH-WLC
------------------------------	------------------------

3. CONCLUSIONS

At approximately 1257 hours CST on 22nd December, 1969, a Cessna 402 aircraft, registered VH-WLC, crashed and caught fire when it struck trees shortly after taking off from Gove, Northern Territory.

- (ii) The aircraft was owned and operated by Leighton Contractors Limited, of Melbourne, and at the time of the accident it was engaged on a private flight.
- (iii) The pilot, Anthony William Scott, and three passengers, Cecil Ryan, Paul Ryan and Kenneth Nelson Nuttall were killed in the accident. A fourth passenger, Norman Cartwright, survived the impact but died soon after he was rescued on 24th December, 1969.
- (iv) The aircraft was virtually destroyed by impact forces and fire.
- (v) The pilot, aged 25 years, held a current commercial pilot licence, endorsed for the Cessna 402 type of aircraft. His total flying experience amounted to 2590 hours, including 1390 hours flown on twin engined aircraft of which 66 hours had been gained on the Cessna 402.
- (vi) The aircraft was operating with a current certificate of airworthiness.
- (vii) There is no evidence that the gross weight of the aircraft and the centre of gravity position were other than within the specified limits.
- (viii) The aerodrome at Gove consists of a sealed runway 6750 feet in length at a mean elevation of 164 feet and having a slope of 0.1% down to the south east. It is suitable for the operation of Cessna 402 aircraft.
- (ix) The weather in the area was poor, with periods of rain and occasional heavy showers and thunderstorms. The observed visibility was between 3 and 6 miles and this could be expected to be reduced to approximately 2 miles in showers and thunderstorms. The general cloud base was 1500 to 2000 feet, but lower stratiform cloud was observed in amounts between 3/8 and 8/8 of sky coverage with an average base of 500 feet above the aerodrome level. The wind in the area was from the north west at an average speed of 25 knots. Because of the nature of the terrain and the general timber rising to some 70 feet in the area, the surface wind in the vicinity of the aerodrome is subjected to considerable retardation. The observed surface wind on the airstrip was about 5 knots from the north west and it is probable that a high turbulence level and a marked velocity gradient existed throughout the 100 feet or so of airspace immediately above the aerodrome and its environs.
- (x) At about 0949 hours on 22nd December, 1969, the pilot submitted a plan to the Air Traffic Control Centre at Darwin for a flight to Gove and return to Darwin. The aircraft was to proceed under the Visual Flight Rules and to maintain full radio reporting procedures. Although some minor difficulty with the weather was encountered, the aircraft arrived in the circuit area at Gove at approximately 1215 hours. The pilot advised the Flight Service Unit at Katherine of this and in accordance with normal procedures he requested that the Search and Rescue watch in respect of the aircraft be terminated. He also advised that he did not know at what time the aircraft would depart.

DEFINITIONS

ACCIDENT - An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all those persons have disembarked and in which

- (a) any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached to the aircraft; or
- (b) the aircraft suffers substantial damage.

FATAL INJURY - Any injury which results in death within 30 days.

SERIOUS INJURY - Any injury other than a fatal injury which

- (a) requires hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received; or
- (b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
- (c) involves lacerations which cause severe haemorrhages, nerve, muscle or tendon damage; or
- (d) involves injury to any internal organ; or
- (e) involves second or third degree burns, or any burns affecting more than five percent of the body surface.

MINOR INJURY - Any injury other than as defined under "Fatal Injury" or "Serious Injury".

DESTROYED - Consumed by fire, demolished or damaged beyond repair.

SUBSTANTIAL DAMAGE - Damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft and which would normally require major repair or replacement of the affected component. The following types of damage are specifically excluded: engine failure, damage limited to an engine, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, taxi-ing damage to propeller blades, damage to tyres, engine accessories, brakes, or wingtips.

MINOR DAMAGE - Damage other than as defined under "Destroyed" or "Substantial Damage".

CONCLUSIONS (Cont'd)

- (xi) The aircraft was refuelled at Gove with 58 gallons of 100 octane aviation fuel and after the passengers and their baggage had been loaded, took off on Runway 13 at approximately 1255 hours on the return flight to Darwin. The aircraft was seen during the take off run and immediately after it had become airborne, but the flight path followed after take off was not observed from the ground by any witness.
- (xii) Following the departure of the aircraft, the clerk in the aerodrome office of an airline operator listened on his 130.6 mcs VHF facility but did not hear the aircraft call. From about 10 minutes after the take off he called the aircraft on this radio two or three times but without response. This was not an unusual situation and no significance was attached to the lack of communication at the time.
- (xiii) The aircraft was not heard to transmit on any frequency used by the Aeronautical Mobile Network and as a consequence the Departmental search and rescue surveillance of the flight was not re-activated through the air/ground communications channels.
- (xiv) Throughout the following morning, 23rd December, the Darwin office of the operator attempted to communicate with Gove to establish whether the aircraft had departed and for what destination. In the early afternoon of that day these efforts were successful and it was learned that the aircraft had departed for Darwin on the previous day. The Air Traffic Control Centre at Darwin Airport was advised of the situation at 1551 hours, 23rd December, 1969.
- (xv) The Air Traffic Control service commenced communications checks of stations in the area and at 1725 hours, when the aircraft had not been located, the Distress Phase of the Search and Rescue procedures was declared. Three aircraft commenced a search on the morning of 24th December, 1969 and, of these, one aircraft departed Darwin at 0645 hours and proceeded to Gove, visually checking en route airstrips in the course of this flight. At 0850 hours observers in this aircraft sighted the wreckage of VH-WLC near the aerodrome at Gove.
- (xvi) A ground party was directed to the scene and reached the accident site at 1000 hours. The surviving passenger was given first aid attention but he died whilst being transported to Gove.
- (xvii) The wreckage was situated some two miles from the airstrip at Gove and 2250 feet to the right of the extended centre line of the runway. The first impact had occurred with the top of a tree while the aircraft was in substantially level flight having gained some 122 feet above the mean runway surface level. A further major tree strike occurred with the starboard wing tip tank, following which the aircraft descended, rolling rapidly to the right until ground impact was made with the starboard wing. The aircraft then cartwheeled, coming to rest upright, 3000 feet from the point of first contact with the trees. It burst into flames but the surviving passenger was able to get clear of the wreckage, a major portion of which was then destroyed by fire.
- (xviii) Detailed examination of the wreckage showed that the starboard nacelle locker door was unlocked and there is evidence that it was open in flight. The starboard propeller was feathered and the starboard engine was not operating at impact. A strip inspection of the starboard engine revealed the presence of a small wedge shaped stone in the oil pump relief valve housing and there were indications that the relief valve had at some time been prevented from closing because some such foreign body had been interposed between the valve face and its seat.
- (xix) Had the oil pressure relief valve been so impeded in closing during the take off at Gove, there would have been a loss of oil pressure, probably to a level below the minimum allowable in flight. Associated with this drop in oil pressure there would be actuation of the turbo-supercharger waste-gate towards the open position and this would have resulted in a significant loss of power from the starboard engine. The normal reaction of a pilot when becoming aware of the instrument indications of this malfunction would be to shut down the affected engine and feather the propeller. There is no evidence of any other malfunction or defect of the engines or airframe which may have caused or contributed to the accident.

DEFINITIONS

ACCIDENT - An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all those persons have disembarked and in which

- (a) any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached to the aircraft; or
- (b) the aircraft suffers substantial damage.

FATAL INJURY - Any injury which results in death within 30 days.

SERIOUS INJURY - Any injury other than a fatal injury which

- (a) requires hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received; or
- (b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
- (c) involves lacerations which cause severe haemorrhages, nerve, muscle or tendon damage; or
- (d) involves injury to any internal organ; or
- (e) involves second or third degree burns, or any burns affecting more than five percent of the body surface.

MINOR INJURY - Any injury other than as defined under "Fatal Injury" or "Serious Injury".

DESTROYED - Consumed by fire, demolished or damaged beyond repair.

SUBSTANTIAL DAMAGE - Damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft and which would normally require major repair or replacement of the affected component. The following types of damage are specifically excluded: engine failure, damage limited to an engine, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, taxi-ing damage to propeller blades, damage to tyres, engine accessories, brakes, or wingtips.

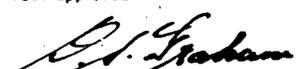
MINOR DAMAGE - Damage other than as defined under "Destroyed" or "Substantial Damage".

CONCLUSIONS (Cont'd)

(XX) From performance figures obtained during the process of certification of the type of aircraft it has been assessed that, had one engine failed at the most critical stage of take off, under normal conditions a climb gradient could have been achieved to clear obstacles on the flight path followed by the aircraft. However, the observed weather conditions on the day of the accident were such that a take off in the down wind direction would probably have involved the aircraft with a wind velocity gradient of a magnitude and direction sufficient to have severely limited the climb gradient of the aircraft when operating on one engine. Also a performance penalty would have been imposed by the drag of the unlocked nacelle locker door. To this situation may be added the normal reduction of performance to be expected from an aircraft in service and the probabilities that the turbulence was severe and that the pilot would be unable to select the most obstacle free climb path due to the visibility conditions. When all these factors are considered the failure of one engine immediately after take off would probably have placed the aircraft in a situation where its performance would be inadequate to outclimb the obstacles on the take off path which was followed.

4. OPINION AS TO CAUSE

The probable cause of the accident was the development of an engine malfunction which led the pilot to shut down that engine in circumstances which prejudiced the ability of the aircraft to outclimb obstacles in the flight path.

Release approved  (D.S. GRAHAM)	Designation Assistant Director-General (Air Safety Investigation)	Date 3.3.1971
---	---	------------------

DEFINITIONS

ACCIDENT - An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all those persons have disembarked and in which

- (a) any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached to the aircraft; or
- (b) the aircraft suffers substantial damage.

FATAL INJURY - Any injury which results in death within 30 days.

SERIOUS INJURY - Any injury other than a fatal injury which

- (a) requires hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received; or
- (b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
- (c) involves lacerations which cause severe haemorrhages, nerve, muscle or tendon damage; or
- (d) involves injury to any internal organ; or
- (e) involves second or third degree burns, or any burns affecting more than five percent of the body surface.

MINOR INJURY - Any injury other than as defined under "Fatal Injury" or "Serious Injury".

DESTROYED - Consumed by fire, demolished or damaged beyond repair.

SUBSTANTIAL DAMAGE - Damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft and which would normally require major repair or replacement of the affected component. The following types of damage are specifically excluded: engine failure, damage limited to an engine, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, taxi-ing damage to propeller blades, damage to tyres, engine accessories, brakes, or wingtips.

MINOR DAMAGE - Damage other than as defined under "Destroyed" or "Substantial Damage".