COMMONWEALTH OF AUSTRALIA DEPARTMENT OF TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION SUMMARY REPORT

Publication of this report is authorised by the Secretary under the provisions of Air Navigation Regulations 283 (1)

Reference No. SI/764/1039

1. LOCATION OF OCCURRENCE

	Height a.m.s.l.	Date	Time (Local)	Zone
79 kilometres southeast of Alice Springs Airport N.T.	1295 feet	9.10.76	2129	CST

2. THE AIRCRAFT

Make and Model	Registration	Certificate of Airworthiness
Cessna 210/5	VH-BNH	Valid from 8.1.71

Certificate of Registration issued to	Operator	Degree of damage to aircraft
		Substantial
		Other property damaged

Defects discovered

Nil

3. THE FLIGHT

Last or intended departure point	Time of departure	Next point of intended landing	Purpose of flight	Class of operation
Leonora, W.A.	1443 CST	Ayers Rock N.T.	Travel	Private

4. THE CREW

Name	Status	Age	Class of licence	Hours on type	Total hours	Degree of injury
	Pilot	38	Private	10	562	Nil

5. OTHER PERSONS (All passengers and persons injured on ground)

Name	Status	Degree of injury	Name	Status	Degree of injury
	Passenger	Minor		Passenger	Nil
	Passenger	Nil		Passenger	Nil
	Passenger	Minor			

6. RELEVANT EVENTS

The pilot's private pilot licence was endorsed to permit him to act as pilot in command of Cessna 210/5 type aircraft and he had recent experience in a comparable type; additionally the licence was endorsed to permit him to fly at night in Visual Meteorological Conditions (VMC).

The aircraft was fitted with automatic direction finding equipment (ADF) but this was unserviceable and known to the pilot prior to the commencement of the flight: the aircraft was not required to be equipped with ADF for the intended flight. The aircraft was not approved for flight in VMC at night.

After obtaining the meteorological forecast which he had requested for the flight, the pilot submitted flight plan details for a VFR flight from Jandakot Airport to Ayers Rock (NT), via Leonora (WA), which was a refuelling stop. The flight was planned to cruise at an altitude of 9000 feet, and the pilot had calculated the time of last light at Ayers Rock as 2007 hours. This calculation was incorrect the correct time for last light being 1910 hours.

The aircraft departed Jandakot Airport at 1026 hours (0856 WST) and arrived at Leonora at 1407 hours; some 60 minutes later than flight planned apparently because of adverse weather which necessitated diversions from the planned route and altitude. The aircraft was refuelled and, after the pilot recalculated the time of last light at Ayers Rock as 1930 hours, the aircraft departed at 1443 hours intending to fly a direct track to Ayers Rock a distance of some 1047 km over terrain difficult for visual navigation. The flight plan estimated time of arrival was 1841 hours, and the fuel endurance was calculated as being 400 minutes at a consumption rate of 50.8 litres per hour.

The meteorological forecast issued to the pilot at Jandakot Airport predicted that to 125° East the winds would be 050/20 at 3000 feet swinging through north to 310/25 at 10 000 feet; in the 125° East to 129° East sector 090/10 at 3000 feet swinging through north to 250/10 at 7000 feet and 250/15 at 10 000 feet; in the final sector 130/13 at 3000 feet swinging through south to 180/10 at 7000 feet and 230/15 at 10 000 feet. At 1536 hours the Kalgoorlie Flight Service Unit (FSU) advised the pilot that the winds for the final sector were now predicted to be 090/15 at 3000 feet, 270/15 at 7000 feet and 250/25 at 10 000 feet. Post analyses of the meteorological conditions suggest that the frontal influence extended to about 126° 30' East rather than 124° 30' East as predicted, that generally the winds had a slightly more significant northerly component than predicted, and the wind for the final half of the flight to Ayers Rock was 260/20 at 10 000 feet.

The pilot states that some 90 minutes after departure from Leonora flying at less than the planned altitude of 9000 feet, he determined he was 18 km north of track. He altered heading 11 degrees to starboard and maintained this heading for some 50 minutes; the aircraft was now cruising at 9000 feet. He then determined to his satisfaction that he was some 46 km north of track and altered heading a further 20 degrees to starboard which he maintained for some 84 minutes. He then returned to the flight planned heading which, basically, was maintained for the next 146 minutes. At the time the pilot returned to the flight planned heading it is probable that the aircraft was some 110 km to the right (south) of the intended track; it is probable that the pilot's estimate of ground speed was consistent with the actual ground speed being made good.

At 1834 hours the Alice Springs FSU advised the pilot that the time of last light at Ayers Rock would be 1910 hours, five minutes prior to the pilot's revised estimate of 1915 hours for his time of arrival. The pilot then elected to continue to Ayers Rock, overfly if he was unable to land, and proceed to Alice Springs. The fuel remaining was sufficient, assuming that the aircraft was on track. Shortly thereafter and prior to last light, the aircraft passed over, and a passenger sighted a homestead with two landing strips nearby.

It is probable that at 1910 hours the aircraft was some 110 to 170 km south of Ayers Rock which was not sighted. The flight was continued to proceed to Alice Springs. The Uncertainty Phase of the search-and-rescue procedures was initiated; it was upgraded to the Alert Phase at 1930 hours and the Distress Phase at 2031 hours. At 2053 hours the aircraft was sighted on the Alice Springs meteorological radar bearing 156 degrees (True) from Alice Springs at a distance of 172 km. The pilot was given headings to fly to reach Alice Springs and an aircraft was despatched to intercept and escort VH-BNH. At 2126 hours the engine stopped due to fuel exhaustion.

The weather was fine, there was a full moon, and the aircraft was equipped with landing lights. Watched the pilot of the escort aircraft, the pilot of VH-BNH force landed some 3 minutes later on rough terrain. The aircraft was substantially damaged but the occupants evacuated without difficulty. Communications were maintained with the escort aircraft. Subsequently provisions were dropped at the accident site and a ground party reached the site the following morning.

Examination of the aircraft did not reveal any evidence of defect or malfunction which might have contributed to the accident. Fuel consumption was 50.2 litres per hour.

OPINION AS TO CAUSE

The cause of the accident was that the pilot did not plan or conduct the flight to the standard of navigation necessary for a long flight over relatively featureless terrain.

Approved for publication	A.R. Woodward	(A.R. Woodward) Delegate of the Secretary	Date 26.4.1978

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

Note. - Specifically excluded are: death from natural causes and fatal or serious injury to any person on board whether self-inflicted or inflicted by another person, or to ground support personnel before or after flight, or fatal or serious injury which is not a direct result of the operation of the aircraft, or which concerns stowaways.

(b) the aircraft suffers substantial damage or is destroyed; or

(c) the aircraft is missing or is completely inaccessible.

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 or its accessories, or to propeller blades; bent fairings or cowlings; small dents or puncture holes in the skin; damage to wing tips, antennas, tires, or brakes.

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