



AIRCRAFT ACCIDENT

REPORT

No. 90-031

**ZENAIR ZODIAC CH600 ZK-ZZT
Near Urenui, Taranaki Province
4 February 1990**

**Transport Accident Investigation Commission
Wellington - New Zealand**

Transport Accident Investigation Commission
Wellington

Chief Commissioner
Transport Accident Investigation Commission

The attached report summarises the circumstances surrounding the accident involving Zenair Zodiac CH600 aircraft ZK-ZZT on 4 February 1990 off the coast near Urenui, Taranaki Province and includes suggested findings.

This report is submitted pursuant to Section 8(2) of the Transport Accident Investigation Act 1990 for the Commission to review the facts and endorse or amend the findings as to the contributing factors and causes of the accident.

19 September 1990

R CHIPPINDALE
Acting Chief Executive

APPROVED FOR RELEASE AS A PUBLIC DOCUMENT

12 October 1990

M F DUNPHY
Chief Commissioner

AIRCRAFT: Zenair Zodiac CH600		OPERATOR: C.H. and C.J. Rees	
REGISTRATION: ZK-ZZT		PILOT: C.H. Rees	
PLACE OF ACCIDENT: Off the coast near Urenui, Taranaki Province		OTHER CREW: Nil	
DATE AND TIME: 4 February 1990, time unknown		PASSENGERS: Nil	
SYNOPSIS: The aircraft departed from New Plymouth for Hamiltong at 1752 hours. Nothing was heard from the aircraft after the pilot acknowledged his take-off clearance. A search aircraft located the pilot's body off the coast of Urenui next day. The aircraft was not found.			
1.1 HISTORY OF THE FLIGHT: See page 4	1.2 INJURIES TO PERSONS: Pilot: Fatal	1.3 DAMAGE TO AIRCRAFT: The aircraft was not located.	1.4 OTHER DAMAGE: None reported
1.5 PERSONNEL INFORMATION: See page 5			
Flight Times			
		Last 90 days	Total
All Types		19	620
On Type		10	70
1.6 AIRCRAFT INFORMATION: See page 6			
1.7 METEOROLOGICAL INFORMATION: See page 6		1.8 AIDS TO NAVIGATION: Not applicable	1.9 COMMUNICATION: See page 7
1.10 AERODROME: Not applicable	1.11 FLIGHT RECORDERS: Not applicable	1.12 WRECKAGE AND IMPACT INFORMATION: Only the main wheels, one seat cushion and a piece of aircraft carpet were recovered as flotsam.	
1.13 MEDICAL AND PATHOLOGICAL INFORMATION: See page 7		1.14 FIRE: Not known	1.15 SURVIVAL ASPECTS: See page 7
1.16 TESTS AND RESEARCH: Nil	1.17 ADDITIONAL INFORMATION: Nil	1.18 USEFUL OR EFFECTIVE INVESTIGATION TECHNIQUES: Nil	
2. ANALYSIS: See page 8	3. FINDINGS: See page 9		
4. SAFETY RECOMMENDATIONS: Nil			

* All times in this report are NZDT (UTC +13 hours)

1. FACTUAL INFORMATION

1.1 History of the Flight

1.1.1 The pilot, Mr Rees, flew ZK-ZZT from Hamilton to New Plymouth on the previous day. That flight was uneventful however he did mention to an acquaintance that he had enjoyed the thrill of "wave hopping" on the way down.

1.1.2 On the morning of the flight Mr Rees arrived at New Plymouth Aerodrome at 1030 hours and about one hour later made arrangements to recharge the battery for the aircraft's radio. He left this on charge until 1615 hours.

1.1.3 In the afternoon he refuelled the aircraft with 30 litres of fuel, to full tanks, from a common user pump which continued to be used by other aircraft thereafter.

1.1.4 He then prepared a flight plan after a 20 minute briefing by the duty Air Traffic Controller Officer (ATCO). The ATCO assisted him to retrieve the relevant Notams from the unusually large number in effect due to Royal Flights. He then obtained the relevant Metars, TAFs and Low Level Meteorological Forecasts for Mr Rees.

1.1.5 During the briefing Mr Rees mentioned his aircraft radio battery had needed charging and the ATCO advised him to make provision for a NORDO (no radio) arrival at Hamilton. This was arranged.

1.1.6 The pilot did not indicate on the flight plan the route which he would follow to Hamilton nor did he discuss it with any of the people to whom he spoke at the Aerodrome.

1.1.7 The Emergency and Survival Equipment section of the flight plan was not completed. Mr Rees did not carry any equipment other than an ELT.

1.1.8 After leaving the Control Tower Mr Rees completed a pre-flight check on ZK-ZZT and boarded the aircraft. He was said to have been in good spirits.

1.1.9 The Tower in acknowledgement of his request for taxi clearance instructed him to taxi and line up on runway 23.

1.1.10 The pilot appeared to complete the normal engine and pre take-off checks before requesting take-off clearance.

1.1.11 The Tower issued a take-off clearance and as no reply was received, repeated it twice before resorting to a green light signal to the pilot.

1.1.12 Shortly after the light signal was displayed the pilot repeated his request for take-off and was surprised that he had not heard the Tower's earlier replies.

1.1.13 At 1752 hours ZK-ZZT took off on runway 23, executed a right and "dumb-bell" turn at 500 feet agl and set heading towards Urenui,

abeam which town the aircraft would leave the New Plymouth Control Zone. The ATCO who had instructed the pilot to report "abeam Urenui" watched the aircraft until it had climbed to between 1000 and 1500 feet about one kilometre inland of the Waitara River mouth. He had the Tower door open and noticed how well the engine appeared to sound.

1.1.14 Nine minutes after ZK-ZZT took off the ATCO realised he had not heard from Mr Rees and called him to confirm that the aircraft had vacated the New Plymouth Control Zone. No response was obtained after the ATCO repeated his call so he accepted, on the basis of the problems he experienced with issuing a take-off clearance, that ZK-ZZT's radio must have failed.

1.1.15 At about 1800 hours a golfer on the Urenui Golf Course was about to play a shot across another fairway. As she looked up to check the fairway was clear she saw an aircraft fitting the description of ZK-ZZT descending towards the sea, without any apparent engine noise. She looked down again to continue her golf before the aircraft went out of sight.

1.1.16 Nothing further was heard or seen of ZK-ZZT but the pilot's body, the aircraft's two mainwheels, a seat cushion and a piece of carpet were recovered from the sea off the Urenui coastline, next morning.

1.5 Personnel information

1.5.1 Crawford Henry Rees, 56, started flying in 1957 but his flying was interrupted by frequent breaks of up to 18 months and he did not complete his training for a Private Pilot Licence (PPL) until 29 August 1969.

1.5.2 His PPL-Aeroplane, number 20865, was valid from 24 May 1989 to 7 May 1990 subject to having correcting half lenses readily available.

1.5.3 After obtaining his licence he continued casual flying with breaks of up to two and a half years before commencing regular flying in 1988.

1.5.4 His only recorded low flying experience was in two periods of dual instruction, one of 40 minutes on 19 December 1970 and one of 30 minutes on 19 July 1980.

1.5.5 He flew in 20 different types of aircraft but principally in the Cessna C150, C152, C172 and C177 and Piper PA18 and PA28.

1.5.6 He flew a total of one hour's solo in two multi-engine aircraft types with a total multi-engine flying time of 13 hours.

1.5.7 He had a total of 89 hours instrument flying practice.

1.5.8 In May 1987 he flew a Zenair Zodiac CH600, his first experience in the type, for a total of 1.2 hours. After that he did no further flying until January 1988 when he conducted his first flight, the test flight, of the Zenair Zodiac ZK-ZZT which he had just built.

1.5.9 Thereafter he flew regularly and exclusively, in ZK-ZZT, for a period of some 73 hours up to the time of the accident.

1.5.10 His last medical examination was on 8 May 1989 when he was assessed as fit for the issue of a PPL for 12 months.

1.6 Aircraft information

1.6.1 Zenair Zodiac CH600 (wide body and tail dragger options) serial number AACA 956 was completed in January 1988. It was a two seat, tailwheel, low wing monoplane aircraft with a one piece bubble canopy. The total time in service was approximately 68 hours.

1.6.2 Its Continental C90-8F engine, serial number 47694-8F manufactured in 1960 had completed approximately 1425 hours in service. A McCauley propeller model SCM 6950, serial number 42381 was fitted to the engine in December 1988.

1.6.3 The Pointer 3000 emergency locator transmitter (ELT) serial number 325825 was serviced and seat belts inspected at 43 hours total aircraft recorded time on 16 January 1990.

1.6.4 The pilot had built the aircraft himself from an approved set of plans. The progress made was steady. From the initial approval of the workshop to the first test flight involved less than 18 months.

1.6.5 The comments of the Civil Aviation Division surveyors indicated a competent standard of workmanship was maintained throughout the construction period.

1.6.6 The test programme revealed two unsatisfactory features:

The propeller was not suited to the engine allowing the engine to overspeed, if not monitored carefully, on take-off and initial climb.

The rudder pedals were unsuitably placed for the pilot's build and his feet tended to slip off them.

1.6.7 A more suitable propeller was fitted and a second test flight showed it to be satisfactory but the rudder pedals continued to be less than desirable although various modifications were tried or proposed.

1.7 Meteorological information

1.7.1 At the time of take-off the wind was 130° at seven knots. The visibility was 70 km. No significant weather was forecast enroute.

1.7.2 The pilot of a parachute dropping aircraft climbed to 8500 feet in the area after the assumed time of the accident without encountering any turbulence or cloud.

1.7.3 The New Zealand Meteorological Service reported the following weather:

“An anticyclone centred to the east of New Zealand extended a ridge of high pressure onto the country. In the late afternoon there was a shallow heat low over North Island.

Surface winds were generally light and variable with sea breezes about the coast.

The hourly reports from New Plymouth indicate that there was little or no cloud and visibility was good.

There was likely to have been some light or moderate mechanical turbulence at low levels over the land, but flying conditions over the sea would have been smooth.

At the sea surface there was a southwesterly swell with a significant height of about one metre. From satellite information the average temperature of the sea was about 18 degrees Celsius, but could have been a little higher at the time of the crash due to the sun's heating. This would have been especially so close inshore."

1.9 Communications

1.9.1 The aircraft was fitted with a ICOM IC-A2 very high frequency (VHF) communications transmitter receiver with an independent battery.

1.9.2 On the day of the accident the transmitter/receiver was noted as exceptionally clear on ground check before start up and during taxi and pre take-off communication with "Tower" at New Plymouth.

1.9.3 The first indication of a difficulty was when the pilot failed to respond to a take-off clearance which was repeated twice. However when the pilot requested a take-off clearance the second time he acknowledged the Tower's clearance immediately.

1.9.4 He was instructed by the Tower to report abeam Urenui at the eastern boundary of the New Plymouth Control Zone but failed to comply with this instruction or to respond to Air Traffic Control attempts to contact him shortly after this report was due.

1.9.5 None of the pilots of aircraft in the area at the time heard any transmission from ZK-ZZT after he departed from New Plymouth.

1.13 Medical and pathological information

1.13.1 The post mortem and toxicological examination did not reveal any evidence to indicate Mr Rees' was unfit for the flight.

1.13.2 After he had entered the sea he succumbed to exposure and loss of blood from numerous lacerations.

1.15 Survival aspects

1.15.1 The sea swell was slight at approximately one metre and the sea temperature 17°C.

1.15.2 The aircraft was fitted with a seat belt but no shoulder restraint. Mr Rees was not wearing a protective helmet.

1.15.3 When Mr Rees was found he had his socks in his pockets. This may have been because he chose to fly in bare feet for a more secure grip on the rudder pedals or that he removed his shoes in anticipation of a ditching.

1.15.4 From the position and heading in which the aircraft was sighted over the Urenui Golf Course he would have had little option but to attempt a ditching.

1.15.5 Once in the water he could have been expected to survive for five or six hours had it not been for his loss of blood which would have jeopardised his chances to an undeterminable extent.

1.15.6 The aircraft carried an ELT which was checked as serviceable and had new batteries fitted three weeks before the accident. It is probable that this ELT went down with the aircraft or was subsequently dropped by Mr Rees as search aircraft which flew over the site listening out on the distress frequency within two hours of the probable time of the accident did not detect any ELT transmissions. New Plymouth Tower personnel some 25 km from the probable accident site also guarded the 121.5 MHz "distress" frequency but heard nothing on this frequency during the period.

1.15.7 The nearest coastline to the position in which Mr Rees was found was predominantly steep cliffs. Although there were stretches of sand where he could have come ashore had he reached land there were no suitable areas for a forced landing on the beach.

1.15.8 Inland from the position in which Mr Rees' aircraft was last sighted there were an abundance of suitable areas for forced landings but these were interspersed with gullies, trees and populated areas which may have prevented him from gliding to a suitable area had an emergency confronted him at an unsuitable combination of height and position.

1.15.9 As Hamilton Tower closed 15 to 20 minutes after ZK-ZZT was due to arrive there it was not overdue at that time and the search and rescue watch remained with Auckland Information who took the appropriate action.

1.15.10 The first search aircraft departed from New Plymouth at 2046 hours and flew over the probable accident site some ten minutes later. As the end of evening civil twilight was 2025 hours it was unlikely that the pilot would have been sighted in the water. But the search aircraft was listening out for any ELT transmissions on 121.5 MHz.

1.15.11 Mr Rees did not carry a life jacket in his aircraft but he may have used the seat squab to assist him to stay afloat.

2. ANALYSIS

2.1 The aircraft was well maintained, correctly serviced and had completed an uneventful cross country flight the day before so there was no indication of an existing mechanical problem which may have led to the premature termination of the flight.

2.2 The fuel was drawn from a source which was in use before and after the accident without causing any reported engine malfunctions and Mr Rees completed a full pre-flight after refuelling which should have eliminated the chance of water contamination. The aircraft was seen to take-off, turn and climb away in the opposite direction with the engine sound indicating it was running normally so fuel contamination leading to engine failure or loss of power was not likely.

2.3 The pilot was fit, well rested and in good spirits when he left the area and subsequent investigations gave no reason to suspect he became incapacitated in the course of the flight.

2.4 The comment which he made about the thrill of "wave hopping" coupled with the location of a small amount of wreckage from the sea introduced the possibility that the pilot attempted the same exploit on the return flight. The sighting of the aircraft over the golf links descending towards the sea with no obvious engine noise from an area which had many adequate forced landing sites may have indicated that the pilot was descending for another period of low flying over the sea or that he had been faced with an engine failure in a position which gave him no alternative but to ditch the aircraft.

2.5 The absence of any RTF calls from the pilot was probably due to a radio malfunction but could have resulted from him flying into the sea before he reached the designated reporting point.

2.6 The weather was fine with excellent visibility, no cloud below 9000 feet and no significant turbulence so weather was unlikely to have been a factor.

2.7 The pilot had a reasonable amount of current experience in the aircraft but had minimal recorded dual instruction in low flying so had he decided to attempt a period of wave hopping over a calm sea he may have misjudged the clearance from the water and collided with it without warning.

2.8 The fact that the only wreckage recovered consisted of two mainwheels broken off at the base of the tubular legs, a seat squab and a piece of carpet would have been consistent with the pilot making a controlled ditching.

2.9 From the evidence available it was not practicable to determine whether an error of judgement coupled with a lack of skill in low flying or an in-flight emergency followed by a well executed ditching culminated in the accident in which Mr Rees lost his life.

3. FINDINGS

3.1 The pilot was fit and appropriately qualified for the flight as planned.

3.2 The aircraft was constructed competently and maintained in accordance with the appropriate procedures.

3.3 The aircraft had sufficient clean fuel for the flight.

3.4 The weather was not a factor.

3.5 There was no conclusive evidence to prove that the pilot was low flying over the sea other than prior to an unavoidable ditching.

3.6 The aircraft engine may have failed or lost power in a position which gave the pilot no choice but to attempt a ditching as close as practicable to the coast.

3.7 The aircraft's ELT was probably serviceable.

3.8 The aircraft's ELT probably sank without transmitting a signal.

3.9 The pilot survived the aircraft's collision with the sea but subsequently succumbed to exposure and haemorrhage.

3.10 Auckland ATS staff had the prime responsibility for initiating SAR action on ZK-ZZT and did so in accordance with existing procedures.

CONCLUSION

Insufficient evidence was available from which to determine the causal factors which led to this accident.

M F Dunphy
Chief Commissioner