Report 99-001

Cessna 206

ZK-DOA

engine failure and ditching

by Pitt Island

18 March 1999

Abstract

On Thursday 18 March 1999 at about 1645 hours, ZK-DOA, a Cessna 206 on an aerial surveillance air transport flight around Pitt Island, had a sudden engine failure and ditched in the sea. The pilot and four passengers escaped from the aircraft and swam to shore without the aid of life-jackets. Life-jackets were on board the aircraft for the occupants' use but there was insufficient time for them to locate and don the jackets.

The aircraft was not recovered from the sea and the cause of the engine failure was not established.

A safety recommendation about the wearing of life-jackets was made to the Civil Aviation Authority.

The Transport Accident Investigation Commission is an independent Crown entity established to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future. Accordingly it is inappropriate that reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The Commission may make recommendations to improve transport safety. The cost of implementing any recommendation must always be balanced against its benefits. Such analysis is a matter for the regulator and the industry.

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List of abbreviations

amsl	above mean sea level
AOD	aft of datum
cg	centre of gravity
E	east
kg	kilograms
km	kilometres
NZST	New Zealand Standard Time (UTC + 12 hours)
OMM	Operations Maintenance Manual
S	south
UTC	Coordinated Universal Time
VHF	very high frequency

Transport Accident Investigation Commission

Aviation Accident Report 99-001

Aircraft type, serial number and registration:	Cessna U206F, U20602203, ZK-DOA
Number and type of engines:	One Continental I0-520-F
Year of manufacture:	1973
Date and time:	18 March 1999, 1645 hours[1]
Location:	The sea, 2 km north-east of Hakepa Hill on Pitt Island Latitude: 44° 15.2' S Longitude: 176° 10' E
Type of flight:	Air transport, charter
Persons on board:	Crew: 1 Passengers: 4
Injuries:	Crew: minor Passengers: all minor
Nature of damage:	Aircraft not recovered, assumed destroyed
Pilot's licence:	Commercial Pilot Licence (Aeroplane)
Pilot's age:	39
Pilot's total flying experience:	610 hours 150 hours on type
Investigator-in-Charge:	K A Mathews

[1] Times in this report are Chatham Island standard time (NZST plus 45 minutes; UTC plus 12 hours and 45 minutes)

1. Factual Information

1.1 History of the flight

1.1.1 On Thursday 18 March 1999 at about 1630 hours, ZK-DOA, a Cessna 206 operated by Air Chathams Limited (the operator), departed from Chatham Islands Aerodrome for an aerial reconnaissance flight around Pitt Island. The flight was planned to return to Chatham Islands Aerodrome. The pilot and four passengers were on board the aircraft.

1.1.2 The passengers intended to survey and photograph various features on Pitt Island, in particular Hakepa Hill. Hakepa Hill has an elevation of 23l metres (758 feet) above mean sea level (amsl) and is situated about 800 metres inland from the seashore on the north-east corner of the island.

1.1.3 The passengers belonged to a party of eight. The pilot had flown four members of the party to Pitt Island in ZK-DOA, landed and left them at the airstrip. He then returned to Chatham Islands Aerodrome and picked up the four passengers for the aerial reconnaissance flight around Pitt Island. The pilot intended to return to Pitt Island after the reconnaissance flight and fly the four party members from the airstrip back to Chatham Islands Aerodrome.

1.1.4 Earlier that afternoon the pilot had flown ZK-DOA on another aerial reconnaissance flight around Chatham Island and Pitt Island. That flight proceeded uneventfully and took about 1.5 hours to complete. At the end of the flight the pilot refuelled ZK-DOA and prepared it for the two further flights to Pitt Island.

1.1.5 Two of the operator's other pilots, the base captain and a pilot-engineer, helped the pilot refuel ZK-DOA. The fuel was taken from a drum using a hand pump with an integral filter. The pilots said that approximately 100 litres of fuel was put into the aircraft, about 50 litres in each wing fuel tank, and that the total fuel quantity on board was about 200 litres. A dip stick, calibrated for ZK-DOA, was used to confirm the quantity of fuel in each tank. The base captain said he helped dip the tanks and believed there was about 110 litres of fuel in the right tank and 100 litres in the left tank. The pilot-engineer said he also assisted with the dipping and that there was about 100 litres of fuel in each tank. The pilot and base captain both said they confirmed that the wing tank caps were correctly secured after the refuelling. The pilot said he took fuel samples from each wing tank and the two aircraft belly fuel drain points. He checked the fuel samples for water contamination. The pilot said he drained the engine fuel strainer at its drain point to eliminate any water that may have collected there. No water contamination of the fuel was detected.

1.1.6 The passengers saw the aircraft being refuelled and the pilot take some fuel samples. The passengers thought it had taken a long time for the fuel to be pumped into the aircraft. Some passengers asked the pilot if there was enough fuel for the flight and he told them he had put 100 litres of fuel into the tanks.

1.1.7 The flight to the airstrip on Pitt Island with the four party members was uneventful and the pilot flew ZK-DOA empty back to Chatham Islands Aerodrome without incident. The round-trip flight took about 30 flying minutes.

1.1.8 The pilot shut down the engine of ZK-DOA at Chatham Islands Aerodrome after he landed. He then loaded the four passengers on board. One passenger was seated next to the pilot, two passengers were seated behind the pilot and front seat passenger, and the fourth passenger was seated on the right rear seat. The pilot ensured the passengers had fastened their seatbelts and he instructed them on the use of the doors. Six life-jackets were on board and a life-jacket was stowed in a pocket on the back of each of the front four seats. The life-jackets for the front seat passenger and pilot were stowed on the side of their respective seats. A life-raft was stowed behind the rear seats in the baggage compartment. No cargo or baggage was loaded on board the aircraft, apart from some small personal items and camera equipment belonging to the aircraft occupants.

1.1.9 No one on board ZK-DOA wore a life-jacket. The passengers said they were not instructed on the use of the life-jackets and life-raft, or made aware of their location. The pilot could not recall if he referred to the jackets or life-raft during his passenger briefing. He said the passengers had all flown in ZK-DOA before and should have been familiar with the location and use of the life-jackets and raft. Two passengers, however, later said that they did not know if any jackets were on board and another passenger thought the jackets were under the seats. One passenger knew that a life-raft was stowed behind the rear seat.

1.1.10 The pilot completed his normal before-take-off checks and selected the left wing tank. He gave a traffic advisory VHF (very high frequency) radio call before departing from Chatham Islands Aerodrome. Personnel on Pitt Island provided a flight following service for ZK-DOA and monitored the progress of the aircraft, including the pilot's advisory radio transmission. The pilot said his advisory radio transmission included the number of persons on board the aircraft.

1.1.11 ZK-DOA took off normally from Chatham Islands Aerodrome and climbed to about 2000 feet amsl before crossing Pitt Strait for the direct flight to Pitt Island. The pilot advised Pitt Island of his intentions shortly after take-off.

1.1.12 The flight proceeded uneventfully in good weather to Pitt Island and took about 15 minutes. The pilot descended the aircraft to about 1000 feet amsl as he approached Pitt Island from the north-west. He flew along the north-east coast and orbited to the right around Hakepa Hill to allow the passengers to take photographs. During the orbit the aircraft descended to a height just above the level of Hakepa Hill, about 800 feet amsl. The pilot completed the orbit and straightened the aircraft on an east to south-east heading some 700 metres off-shore.

1.1.13 The pilot turned to ask the passengers what their requirements were and if they wanted him to complete another orbit, when the engine lost power suddenly without any warning.

1.1.14 The pilot said the loss of power sounded similar to the throttle being closed quickly. He immediately pushed the throttle forward fully and checked that the mixture was rich. Around the time the engine lost power he noticed the fuel flow gauge reading zero. He changed the fuel selector to the right wing tank but the engine did not regain power.

1.1.15 The pilot turned the aircraft to the south toward Kahuitara Point briefly before determining that it would not glide past the jagged coastline which was unsuitable for a landing. He decided that a better option for an emergency landing was near the coastline behind him, so he turned the aircraft to the left through about 180 degrees to get as close to shore as possible.

1.1.16 The aircraft descended quickly after it lost power and when the pilot manoeuvred it back toward the shore. During the descent the pilot tried to determine why the engine stopped and attempted to restore the power. He made a distress call to the Pitt Island flight following personnel advising them of the situation. He also told the passengers to prepare for a ditching and to tighten their seat belts and to crack open the doors.

1.1.17 The pilot checked the circuit breakers thinking that an electric fuel pump circuit breaker may have tripped causing the loss of power. He said he had experienced a loss of fuel flow in another aircraft type when the electric fuel pump circuit breaker tripped, so consequently he instinctively checked the circuit breakers in ZK-DOA after he saw the fuel flow reduce. The pilot did not select the auxiliary electric fuel pump switch on during his checks.

1.1.18 The pilot did not lower flap for the ditching. He knew that if flap was lowered the rear double cabin door could not be opened and would hinder the passengers' escape from the aircraft.

1.1.19 The sea was relatively calm and the aircraft impacted the water sooner than the pilot expected, about 800 metres from shore. The aircraft occupants reported that the aircraft nosed down during the ditching, inverted and sank quickly. All the occupants escaped from the sinking aircraft and managed to swim to the surface. No one was able to locate and don a life-jacket during the short time of about 30 seconds from when the engine failed to the impact with the water. The life-raft was not deployed.

1.1.20 The aircraft occupants received minor injuries, including abrasions, during the impact and their escape from the aircraft. The occupants assisted one another to swim to shore and were aided by an on-shore current. They believed they were in the water for about one hour before they reached the safety of the shore. All the occupants suffered from varying degrees of hypothermia.

1.1.21 The Pitt Island flight following personnel alerted the operator and emergency services shortly after the pilot made his distress call. Local fishing boats sailed to the area but arrived soon after the aircraft occupants swam to safety. The occupants landed on a shore that was largely inaccessible by land, but a number of Pitt Island residents travelled to the scene to assist them. By the time the occupants reached shore a bonfire had been started and dry clothing and blankets were given to them. A local doctor and nurse attended the occupants who all suffered from shock.

1.2 Damage to the aircraft

1.2.1 The aircraft was not recovered from the sea.

1.3 Pilot information

1.3.1 The pilot of ZK-DOA was a male aged 39 years. He held a Commercial Pilot Licence (Aeroplane) and an instrument rating. His Class 1 medical certificate was valid until 31 May 1999 with no restrictions. He held various aircraft type ratings including a rating for the Cessna 206.

1.3.2 The pilot successfully completed his Commercial Pilot Licence training in December 1993. He gained a single-engine instrument rating at Napier in October 1996, but had not completed an instrument competency check since then. The pilot had recently lost his pilot log book, but the operator's records showed his total flying experience amounted to about 610 hours. He had flown around 150 hours in the Cessna 206 aircraft type, including some 120 hours in ZK-DOA. His flying experience was being recorded on the operator's records for transfer to his log book once it was recovered or replaced.

1.3.3 The pilot was employed by the operator from 27 October 1998 on a five month contract and he was paid a salary. He was stationed on Chatham Island and flew ZK-DOA. He had previously worked for the operator for about three months in 1995.

1.3.4 The pilot completed a biennial flight review at Napier during October 1997. After he arrived at Chatham Island he was given refamiliarisation training and Regulation 76 and 77 flight checks in ZK-DOA, amounting to 4.8 hours flying time. The check sheet indicated that he had flown to a good standard.

1.3.5 The pilot typically started work each day about 0930 hours and finished around 1630 hours. On the day of the accident he started work at 1300 hours. He had regular periods off duty. He had been off duty from 14 March to 16 March. On 17 March, the day before the accident, he worked eight hours and recorded 1.4 hours flight time which included two return flights to Pitt Island.

1.3.6 During the 90 days before the accident the pilot recorded 71 flying hours and 237 duty hours. In the 30 days he recorded 30 flying hours and 106 duty hours. In the 7 days up to the accident he recorded 8 flying hours and 32 duty hours.

1.3.7 The pilot flew only ZK-DOA and operated between and around Chatham Island and Pitt Island. He had flown the aircraft numerous times on the route between Chatham Island and Pitt Island. He was familiar with the weather conditions and local area.

1.3.8 In December 1998 the pilot received water survival training which included the use of life-jackets, life-rafts and aviation medicine training.

1.4 Aircraft information

1.4.1 The Cessna 206F is a six-place all-metal single-engine high-wing light aircraft of conventional design, fitted with a fixed tricycle undercarriage. The cabin layout comprises pilot and front passenger seating, a centre double passenger seat and a rear double passenger seat. The doors include a left front door and a double right rear door for access to the centre and rear passenger seats and cargo compartment. Cessna 206F, ZK-DOA, serial number U20602203, was manufactured in the United States in 1973. The operator purchased ZK-DOA during 1989 and stationed it at Chatham Islands Aerodrome from that time.

1.4.2 ZK-DOA was listed in the operator's Operations Specifications as being approved for air transport operations. The Operator's Maintenance Manual (OMM), approved by the Civil Aviation Authority, required the aircraft to be maintained in accordance with its approved manufacturer's maintenance programme. The aircraft had been issued a non-terminating Airworthiness Certificate in the standard category.

1.4.3 The aircraft records indicated that ZK-DOA was maintained in accordance with the provisions of the OMM. The OMM stated the aircraft was to be given a maintenance inspection at least every 50 flying hours.

1.4.4 An annual maintenance review of the aircraft was recorded as having been completed during May 1998. The most recent maintenance inspection was an Operation #4 inspection recorded as having been completed on 4 March 1999. The technical log was valid from that time for a further 50 flying hours, until the aircraft had accumulated a total of 5752.85 aircraft hours or 4 September 1999, whichever occurred first. At the time of the accident the aircraft had flown 11.7 hours since the last inspection and amassed a total of 5714.55 flying hours. The maintenance required before the next inspection date was a maintenance review by May 1999 and an instruments and avionics inspection by August 1999. No known defects were recorded as outstanding at the time of the accident. All relevant Airworthiness Directives were recorded as being complied with.

1.4.5 The aircraft was fitted with a Continental I0-520-F engine, serial number 557464. Maintenance records indicated that at the time of the most recent inspection on 4 March 1999 the engine had amassed 3396.1 operating hours since new, and 1407.9 hours since its last overhaul in November 1986. The engine had a life of 1700 hours before overhaul with no calendar limit.

1.4.6 The propeller, a McCauley D3A32C90, serial number 755805, had a recorded time in service at the last inspection of 124.25 hours since overhaul.

1.4.7 During the last engine inspection, completed on 4 March 1999, numbers three and five cylinders were replaced because of cracking in the cylinder heads. Following the cylinder replacements the engine was run and checked. The check included a cylinder leak check. The engine run and checks were found to be satisfactory.

1.4.8 Extensive anti-corrosion work had recently been carried out on the aircraft which was being prepared for painting. At the time of the accident areas of green priming paint covered much of the aircraft surface.

1.4.9 During the morning before the accident, the base captain and the pilot-engineer had flown two separate training flights in ZK-DOA for a total of about 1.6 hours. The pilots refuelled the aircraft after the first flight. Following the second flight they tested the magnetos and noticed a magneto drop of some 130 revolutions per minute on the right magneto. The normal maximum drop allowed is 150 revolutions per minute . The pilot-engineer replaced the spark plugs connected to the right magneto and removed the right magneto and checked it. He refitted the right magneto and ensured that the timing of both magnetos was set correctly. The pilot-engineer ran the engine and checked the magnetos for correct operation.

1.4.10 The base captain and the pilot-engineer reported that the aircraft performed normally during their two flights. The pilot also reported that the aircraft performed normally during his flights, totalling about 2.1 hours, before the accident. The pilot said he checked the magnetos before his flights and that they functioned normally.

1.4.11 The four party members who had flown to Pitt Island in ZK-DOA before the accident reported that the engine performed normally during their flight. The passengers on the accident flight did not notice anything untoward until the engine failed. They said the engine was running normally and that, without warning, it stopped suddenly. The pilot did not detect anything untoward until he heard the power reduction and noticed the fuel flow reading at zero. He said the propeller continued to turn after the engine lost power.

1.4.12 The pilots who flew ZK-DOA reported that it performed normally. In the six weeks since the last maintenance inspection of the aircraft, up to the time of the accident, there were no malfunctions or defects reported with the aircraft or its systems, apart from the magneto drop which was within acceptable limits.

1.4.13 The aircraft was equipped with two bladder wing fuel tanks, one in each wing. At the time of the accident ZK-DOA probably had a total of about 150 litres of fuel on board giving an endurance of about 2.5 hours. The left tank probably had about 65 litres of fuel remaining and the right tank 85 litres. The normal fuel consumption was around 60 litres per hour.

1.4.14 The pilot said he normally allowed the fuel level in ZK-DOA to drop to about 60 litres in each tank before he refuelled. The standard fuel load was 200 litres, 100 litres in each tank. The operating procedure for wing tank selection when flying to Pitt Island was to fly each leg on a different tank. The pilot said he always selected the left tank when flying to Pitt Island and the right tank for the return leg back to Chatham Islands Aerodrome.

1.4.15 The aircraft was kept in a hangar at Chatham Islands Aerodrome. During the time the aircraft had been stationed at Chatham Island there were no reported incidents of unusual engine problems or sudden engine power losses. The operator advised that the aircraft had performed satisfactorily during its time at Chatham Island.

1.4.16 The aircraft was refuelled from drum stock using an approved hand pump and integral filtering system designed to prevent water passing through it. After a new drum was opened it was kept on a trolley in the hangar. Following the accident the fuel drum, pump and filtering system were impounded and subsequently inspected. The drum, pump and filter did not contain any water or other contaminants. The fuel was the correct grade. The counter on the fuel pump recorded that 94.5 litres of fuel had been pumped the last time it was used.

1.4.17 The Pilot's Operating Handbook for the Cessna 206F stated that a failure of the engine-driven fuel pump will be evidenced by a sudden reduction in the fuel flow indication prior to a loss of power, while operating from a fuel tank containing adequate fuel. The handbook said that if an engine-driven fuel pump failed during cruising flight, selection of the auxiliary fuel pump switch to the "HI" position, or holding the switch in the "MAX HI" position, should provide sufficient fuel flow to sustain operation of the engine.

1.4.18 Following the accident the all-up weight of the aircraft was calculated to have been around 3125 pounds (1417 kg) at the time the engine failed. The maximum authorised all-up weight was 3600 pounds (1633 kg). At an all-up weight of 3125 pounds the permissible centre of gravity (cg) forward limit was 38.2 inches (970.3 mm) aft of datum (AOD), and the aft limit 49.7 inches (1262.4 mm) AOD. The probable cg was calculated to be within the allowable cg range, about 43 inches AOD.

1.5 Meteorological information

1.5.1 The pilot, the passengers, the four party members flown to Pitt Island and local residents reported that the weather conditions were very good on the day of the accident. They said it was warm, that there was no cloud or rain and that very little wind was blowing. Photographs taken by one of the passengers showed that the weather conditions were fine and sunny with good visibility.

1.5.2 Before flying to Pitt Island the pilot contacted the flight following personnel on Pitt Island to get a report on their local weather conditions.

1.6 Communications

1.6.1 The aircraft was equipped with a VHF transceiver for normal air to ground and air to air communications and a marine band VHF transceiver.

1.7 Survival

1.7.1 The aircraft occupants were restrained by seat belts during the water impact. The restraint system prevented concussion and other injuries which may have hampered the occupants' escape.

1.7.2 The temperature of the water was reported to be about 16 degrees Celsius. The prevailing weather conditions, an on-shore current and the aircraft occupants' ability to swim and assist one another for about 800 metres to shore over a period of around one hour, without the aid of life-jackets, was significant in their survival.

1.8 Organisational information

1.8.1 A maintenance contractor based at Hastings maintained ZK-DOA as a maintenance service provider in accordance with Civil Aviation Rules Part 43. Maintenance personnel travelled to Chatham Islands Aerodrome to carry out the maintenance necessary on the aircraft.

1.8.2 The operator's maintenance controller was also the operator's operations manager and reported to the operator's chief executive officer. The maintenance controller was responsible to ensure the maintenance contractor carried out the required maintenance on the aircraft.

1.8.3 A review of the audit reports for the most recent Civil Aviation Authority audits of the operator did not show any areas of concern that may have contributed to the engine failure and subsequent ditching.

1.8.4 The Chatham Islands Aerodrome emergency plan covered the possibility of a ditching and was activated after the flight following personnel on Pitt Island reported that ZK-DOA had ditched.

2. Analysis

2.1 The accident flight began as a normal event and was conducted at a safe altitude in good weather conditions by a qualified pilot who was familiar with the aircraft, route and operation. Although the exterior of the aircraft was mottled because of the anti-corrosive work and priming paint, giving the appearance of a poorly maintained aircraft, the records and history of the aircraft indicated that it had been maintained and operated satisfactorily during its time at Chatham Island.

2.2 There was no evidence that incorrect maintenance contributed to the engine power loss. The engine was nearing the end of its service life and had approximately 280 hours to run to overhaul. Because the aircraft utilisation was low with an average of around 100 flying hours per year, the engine overhaul was some two or three years away. The engine had been performing satisfactorily up to the time of the accident and recent maintenance showed that any engine defects were being corrected promptly. The pilot-engineer began work two days before the accident and was employed to fly ZK-DOA as well as carry out most of the maintenance necessary on the aircraft.

2.3 There was no evidence that incorrect fuel management or contaminated fuel led to the engine failure. The aircraft should have had sufficient fuel in either wing tank to complete the flight safely and the pilot quickly selected the other wing tank when the engine lost power.

2.4 Because the aircraft was not recovered it was not possible to determine why the engine failed. The engine lost power suddenly and there was no evidence that the engine was running rough, was gradually losing power, had seized, or that a major mechanical disruption had occurred.

2.5 Once the engine lost power the pilot had to maintain control of the aircraft and prepare for an emergency landing or ditching. In addition he tried to diagnose why the engine had stopped and restart it, put out a distress call and brief the passengers. In the approximately thirty seconds from when the engine failed to the ditching the pilot had little time to complete a thorough trouble check of the engine. Consequently he did not select the auxiliary fuel pump on, which should have restored the engine power if the engine-driven fuel pump had failed.

2.6 The pilot's actions in checking the circuit breakers for an electric fuel pump failure and omitting to quickly select the auxiliary fuel pump on, suggests that he might not have had a good working knowledge of the fuel system and emergency procedures. The pilot, however, indicated that he understood the purpose of the auxiliary fuel pump and the functioning of the fuel system. Because of the pressure of the emergency and attendant time constraint the pilot could have been confused when he checked the circuit breakers rather than turning the auxiliary fuel pump switch on.

2.7 The aircraft was fitted with six life-jackets, one for each of the passengers and pilot in accordance with Civil Aviation requirements. They were not required to be worn. Even though a life-raft was not required, one was carried on board the aircraft. The pilot briefed the passengers before departure but did not ensure that they knew where the life-jackets and life-raft were stowed or how to use them. Consequently none of the passengers donned a life-jacket.

2.8 Because of the short time available between the engine failure and the ditching the pilot was not able to instruct the passengers on the use of the life-jackets and life-raft, as well as handle the emergency, attempt to restart the engine, transmit a distress message and prepare for a ditching. The aircraft sank quickly after the ditching and the passengers and pilot did not have enough time at that point to locate the life-jackets or life-raft. If the aircraft occupants had already donned their life-jackets or been wearing the pouch-type life-jackets[2] that fastened around their waists, and been instructed in their correct use, an important survival aid should have been available to them. The pouch-type life-jacket is designed to be durable, and donned and inflated only after the wearer enters the water.

2.9 Life-jackets donned and used correctly are important for the buoyancy and survival of the survivors of a ditching. Fortunately the favourable weather conditions, sea state and water temperature helped the occupants of ZK-DOA to swim to shore safely after they escaped from the sinking aircraft, without the aid of life-jackets. The survival situation could have been different, however, had the conditions been less favourable and the occupants not physically capable of swimming some 800 metres to shore over a period of about one hour.

3. Findings

Findings are listed in order of development and not in order of priority.

3.1 The pilot was appropriately licensed, authorised and fit to conduct the flight.

3.2 The aircraft was approved and appropriate for the type of operation being conducted.

3.3 The aircraft had a valid Certificate of Airworthiness, and its records indicated it was airworthy and operating within the required maintenance period.

3.4 The engine of the aircraft failed suddenly without warning.

3.5 The fuel management procedures were adequate.

3.6 The cause of the engine failure was not established.

3.7 The weather conditions were suitable for the flight.

3.8 The flight following system enabled a quick emergency services response to the ditching.

[2] A life-jacket folded and fitted inside a pouch for protection and removed from the pouch only when required for use

3.9 The passengers in the aircraft were either unsure if life-jackets were on board or of their location.

3.10 Had the passengers been required to wear life-jackets, and instructed in their use, a valuable survival aid should have been available to them.

4. Safety Recommendation

4.1 On 1 July 1999 the Commission recommended to the Director of Civil Aviation that he:

4.1.1 amend the Civil Aviation Rules to require the wearing of life-jackets, preferably the pouch-type fastened around the waist, by all occupants of single-engined aircraft, or multi-engined aircraft unable to maintain 1000 feet above the surface of water with one engine inoperative, operating below 2000 feet above the surface of water and outside gliding distance from land. (040/99)

4.2 On 19 July 1999 the Director of Civil Aviation responded as follows:

4.2.1 I will adopt this Final Safety Recommendation as a petition for rule-making.

However, I would again draw your attention to the fact that there may be some problems with the implementation of the recommendation as worded.

This is seen to arise due to the fact that it is likely that, on many occasions, it will be able to be shown that it is impractical and/or not cost-beneficial to require either crew or passengers to wear a lifejacket when the aircraft is only over water during its take-off and/or landing phase(s) of flight.

The acceptance of the Recommendation as a petition for rule-making will be initiated within a month, but no time frame can be given for its completion.

Approved for publication 11 August 1999

Hon. W P Jeffries
Chief Commissioner