



AIRCRAFT ACCIDENT REPORT

OCCURRENCE NUMBER 05/2471

CESSNA 182R

ZK-FGS

WAIPARA RIVER

7 AUGUST 2005

Glossary of abbreviations used in this report:

ACNZ	Airways Corporation of New Zealand Limited
AGL	above ground level
AMSL	above mean sea level
ARFOR	Area Forecast
ATC	air traffic control
ATS	air traffic services
Avgas	aviation gasoline
°C	degrees Celsius
CAR(s)	Civil Aviation Rule(s)
CAA	Civil Aviation Authority
E	east
ELT	emergency locator transmitter
FIO	Flight Information Officer
ft	foot (feet)
GPS	global positioning system
hPa	hectopascals
IFIS	Internet Flight Information Service
IMC	instrument meteorological conditions
km	kilometre(s)
l	Litre(s)
m	metre(s)
METAR	Meteorological Report (at aerodrome)
MHz	Megahertz
min	minute(s)
nm	nautical miles
N	north
NZST	New Zealand Standard Time
PIC	pilot in command
PPL(A)	Private Pilot Licence (Aeroplane)
QNH	Atmospheric Pressure at Mean Sea Level
RNZAF	Royal New Zealand Air Force
rpm	revolutions per minute
S	south
SAR	search and rescue

SARWATCH	search and rescue alerting service
sec	second(s)
SPAR	Special Aerodrome Report
SPECI	Special issue of a METAR
°T	degrees true
TAF	Terminal Aerodrome Forecast
UTC	Coordinated Universal Time
VFR	visual flight rules
VHF	very high frequency
VMC	visual meteorological conditions

AIRCRAFT ACCIDENT REPORT

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Aircraft type, serial number and registration:	Cessna 182R, 18268374, ZK-FGS
Number and type of engines:	One Continental O-470-U
Year of manufacture:	1984
Date and time:	7 August 2005, 1515 hours*
Location:	0.7 NE of Waipara RM Latitude: S 43° 09.081' Longitude: E 172° 48.720'
Type of flight:	Private
Persons on board:	Crew: 1 Passengers: 1
Injuries:	Crew: 1 fatal Passengers: 1 fatal
Nature of damage:	Aircraft missing, presumed destroyed
Pilot-in-command's licence:	Private Pilot Licence (Aeroplane)
Pilot-in-command's age:	60 years
Pilot-in-command's total flying experience:	Unknown
Information sources:	Civil Aviation Authority field investigation
Investigator in Charge:	Mr S J Walker

* Times are NZST (UTC + 12 hours) unless otherwise stated.

Synopsis

The Rescue Coordination Centre of New Zealand was notified of the missing aircraft by the Police on Monday 8 August 2005. The Transport Accident Investigation Commission was in turn notified shortly thereafter, but declined to investigate. A Civil Aviation Authority investigation was commenced later that day.

The pilot and his wife were on the final leg of a trip which had taken several days. They had departed from Nelson for the flight to the pilot's private airstrip at Aylesbury, located approximately 18 km to the west of Christchurch.

During the evening on the day of the accident the pilot's neighbour realised that ZK-FGS had not returned as expected. The following morning he alerted the emergency services.

At about the same time that a search was being commenced two bodies and fragments of aircraft wreckage were discovered on the shoreline near the Amberley Beach golf course. The bodies were subsequently identified as the occupants of ZK-FGS.

1. Factual information

1.1 History of the flight

- 1.1.1 The Garmin GPSMAP 269 portable GPS satellite receiver carried in ZK-FGS, used by the pilot to navigate and record track data, was found on the shoreline four days after the accident by a member of the public. The receiver was sent to the manufacturer where the electronic data was retrieved from it. This data revealed detailed information about the final flight and numerous previous flights.
- 1.1.2 The pilot and his wife had spent three days touring New Zealand commencing from the private airstrip at Aylesbury near Christchurch, including stops at Taupo, Masterton, Napier, Wanganui and Nelson.
- 1.1.3 At 1342 hours on Sunday 7 August ZK-FGS departed from Nelson for the final leg of the return trip to Aylesbury. The GPS data indicated that the flight proceeded via the Marlborough Sounds, transiting through the Woodbourne area at 1000 ft AMSL before climbing to operate at between 1500 ft and 2000 ft AMSL.
- 1.1.4 Once overhead Kaikoura, the aircraft descended through approximately 1300 ft AMSL adjacent to the Conway River Mouth and continued to descend, reaching 600 ft AMSL adjacent to the Hurunui River Mouth.
- 1.1.5 The pilot continued to track along the coast to Motunau Island where at 1508:04 hours he carried out a 360° left hand descending turn. Once the turn had been completed, he continued toward Amberley, tracking the coastline below 500 ft AMSL.
- 1.1.6 At 1514:50 hours, whilst descending through 300 ft AMSL adjacent to the Waipara River mouth, the aircraft commenced "rate one" turn to the left. The

aircraft continued to descend in the turn to 180 ft AMSL. At this point the aircraft began to climb but remained in the left turn. The climbing turn continued to approximately 320 ft AMSL when at 1515:29 hours the GPS recorded an altitude of 333 ft AMSL, ground speed of 215 knots and an abrupt heading change to 070° T. The recorded data ends with a partial plot indicating 315 ft at 15:15:33 hours.

1.1.7 There were no witnesses to the disappearance of ZK-FGS and, despite extensive searching using a Navy vessel equipped with sidescan sonar and professional salvage divers, the main portion of the wreckage was not located. Numerous small pieces of aircraft structure were washed ashore over a large area of coastline to the south of Waipara River mouth.

1.1.8 The accident occurred in daylight at approximately 1515 hours NZST in the sea at a location about 1 nm north-east of the Waipara River mouth. Latitude S 43° 09.081, longitude E 172° 48.720.



1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Other</i>
Fatal	1	1	0
Serious	0	0	0
Minor/None	0	0	

1.3 Damage to aircraft

1.3.1 The aircraft was destroyed.

1.4 Other damage

1.4.1 Nil.

1.5 Personnel information

- 1.5.1 The pilot held a PPL(A), however his Class 2 Medical Certificate had expired on 30 July 2005 and had not been renewed. The expired Medical Certificate was endorsed with the requirement that he must wear trifocal spectacles; alternatively, the spectacles could be fitted with progressive focus lenses.
- 1.5.2 The pilot's total flight time could not be determined as his log book, which was recovered after being washed ashore, was unreadable. The data from the GPS unit revealed that ZK-FGS had flown 18.8 hours in the previous 90 days and 28.45 hours since 19 February 2005.
- 1.5.3 The pilot did not hold an instrument rating to allow him to fly in IMC. The CARs require that a pilot who is not instrument rated must ensure that any flight undertaken is flown under visual flight rules.

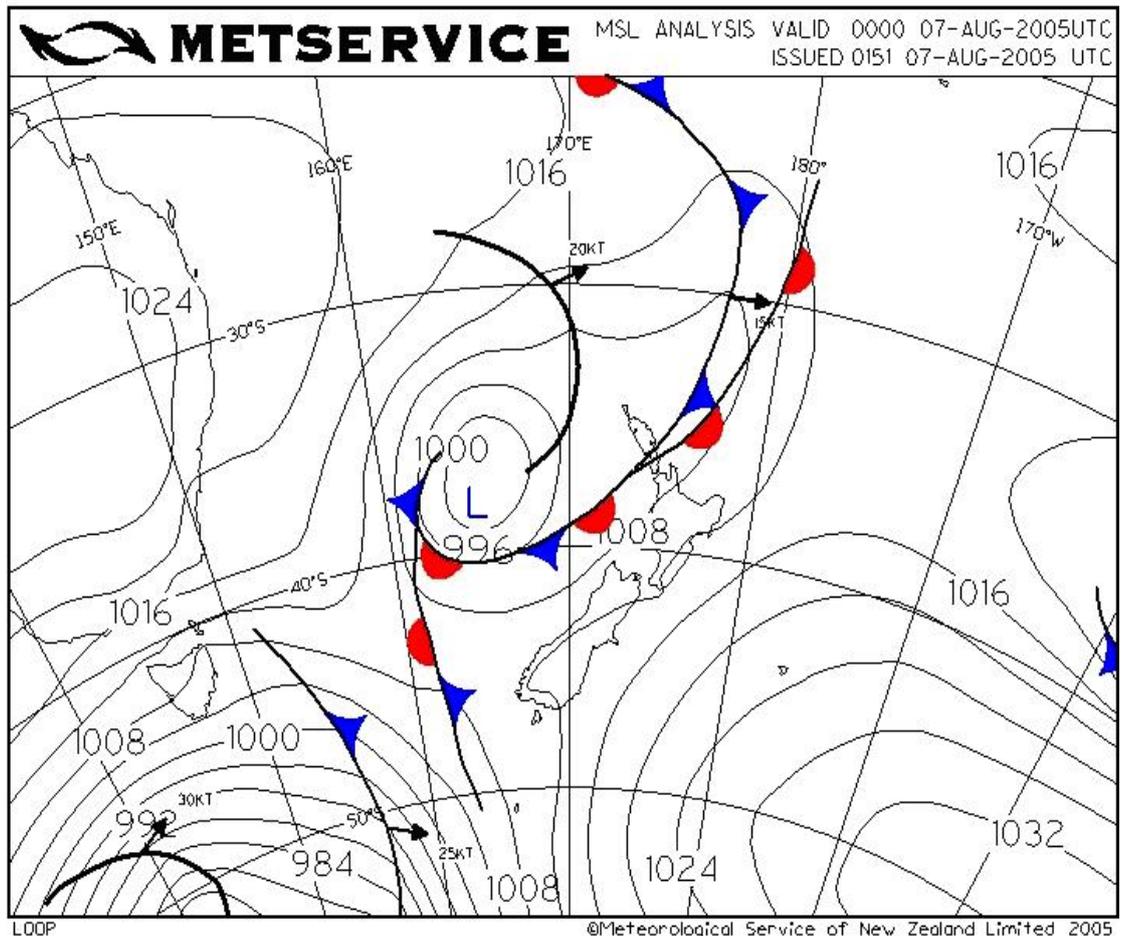
1.6 Aircraft information

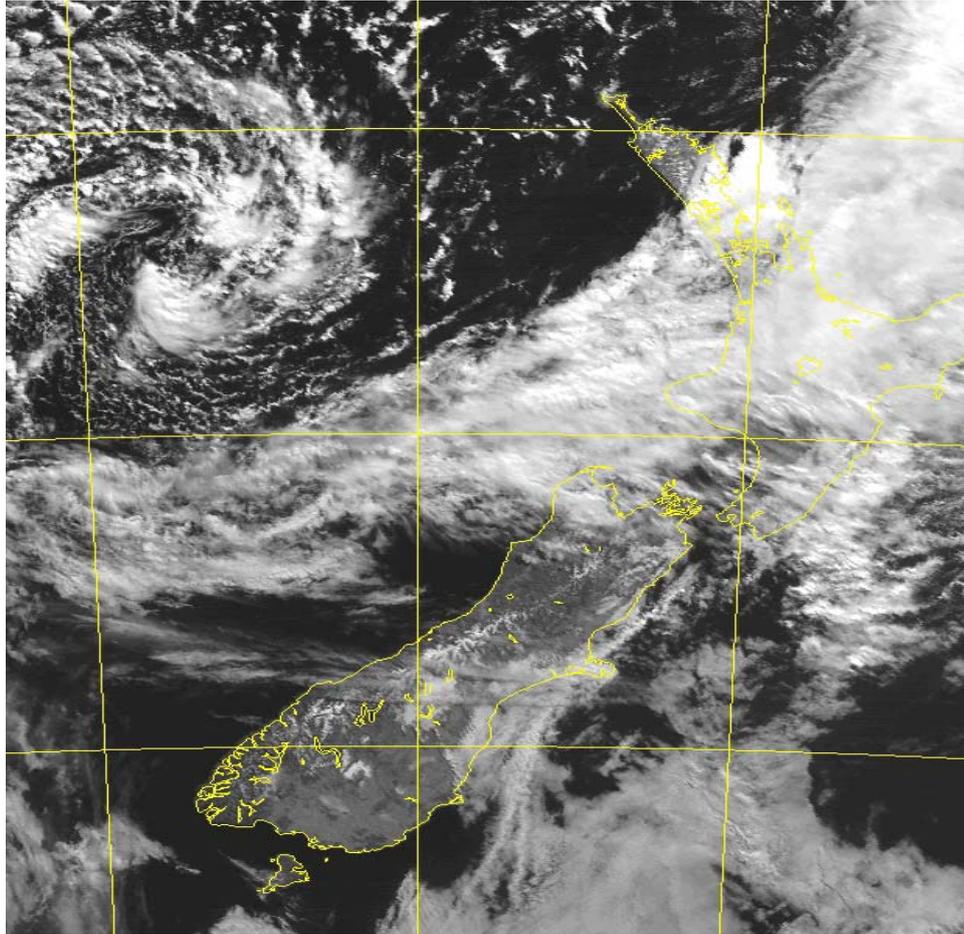
- 1.6.1 Cessna 182R, serial number 18268374, ZK-FGS had accrued approximately 2740 hours total time in service up to the time of the accident. The most recent maintenance was a 100-hour inspection that was carried out on 23 February 2005. There were no entries in the maintenance documentation recording any defect that may have compromised the aircraft serviceability on the day of the accident
- 1.6.2 A non-terminating Airworthiness Certificate was issued on 27 February 1984. The last Annual Review of Airworthiness was carried out on 23 February 2005 with no reported discrepancies.
- 1.6.3 The Continental O-470-U engine, serial number 809849, had completed 790.0 hours up to the last maintenance visit on 23 February 2005 and a further 23.45 hours up to the time of the accident.

- 1.6.4 The total fuel capacity of the aircraft was 348 litres, carried in two equal capacity standard range wing tanks. Of the total, 333 litres was useable fuel. Fuel consumption figures quoted in the Cessna Pilots Operating Handbook suggest burn rates of between 45 l/hour at 2300 rpm to 48 l/hour at 2400 rpm (at 2000ft on an 11 ° C day with 22 inches of manifold pressure). Fuel records for the aircraft revealed that 462 litres of fuel was uplifted during the entire trip which, when the known flight data was analysed in respect of fuel endurance, provided sufficient fuel to complete the intended flight and maintain the required reserve.
- 1.6.5 The load sheet for the final flight was not recovered and no evidence was available to verify whether the aircraft loading was within the limits specified in the manufacturer's Pilots Operating Handbook.

1.7 Meteorological information

- 1.7.1 At 1200 hours NZST on 7 August 2005, (0000 hours UTC 7 August 2005), a low pressure system existed in the mid Tasman, centred west of Taranaki, moving north east at about 20 knots, with an associated complex frontal system lying to the north of Taranaki through to the north of Auckland. To the south of Auckland, the associated moist on-shore north-easterly flow ahead of the front covered New Zealand. Satellite imagery revealed heavy cloud over the centre of North Island, the southeast coast of North Island and the east coast of the South Island.





1.7.2 On the morning of August 7 the pilot made a request to the Airways IFIS website (www.ifis.airways.co.nz) for a copy of the applicable NOTAMS, TAF's and METARS for the South Island, north of a line from Dunedin to Milford Sound, including Wellington. The information that was sent to the pilot at 1029 hours on 7 August 2005 was as follows:

- TAF NZNS 062110Z 062112
VRB02KT 30KM SCT030 BKN050
2000FT WIND 09010KT =

*Aerodrome Forecast for Nelson issued at 0910 hours NZST on 7 August, valid from 0900 hours until 0000 hours NZST. Wind 02 knots, variable direction, visibility 30 km, cloud scattered (3–4 oktas) at 3000 ft AGL and broken (5–7 oktas) at 5000 feet AGL. 2000 ft wind 090T at 10 knots.

- TAF NZWB 062110Z 062112
27005KT 30KM SCT020 BKN040
BECMG 2301 08010KT
TEMPO 0612 6000 DZ BKN011
2000FT WIND 07015KT =

* Aerodrome Forecast for Woodbourne issued at 0910 hours NZST on 7 August, valid from 0900 hours until 0000 hours NZST. Wind 05 knots from 270T, visibility 30 km, cloud scattered (3–4 oktas) at 2000 ft AGL and broken (5–7 oktas) at 4000 ft AGL. During the period between 1100 hours and 1300 hours NZST, the wind is forecast to become 080T at 10 knots. Temporarily (for periods of less than one hour), between 1800 hours and 0000 hours NZST, visibility reducing to 6000 m in moderate drizzle, cloud broken (5–7 oktas) at 1100 ft. 2000 ft wind 070T at 15 knots.

- SPAR NZCH 062100Z
VIS 20KM RED 5000M BR
CLD BKN012=

*Special Aerodrome Report for Christchurch issued at 0900 hours NZST on 7 August, indicating that visibility was 20 km, reducing to 5000 m in mist. Cloud broken (5–7 oktas) at 1200 ft AGL.

- SPECI NZCH 062200Z
32002KT 5000 PRFG BKN012 07/07 Q1014
BECMG 20KM HZ SCT008 BKN018=

*Christchurch Special issued at 1000 hours NZST on 7 August. Observation of 02 knot winds from 320T, visibility of 5000 m with partial fog. Cloud broken (5–7 oktas) at 1200 ft AGL. Temperature 7°C and dew point also 7°C. The QNH was 1014 hPa. Visibility becoming 20 km in haze, cloud scattered (3–4 oktas) at 800 ft AGL and broken (5–7 oktas) at 1800 ft AGL.

- TAF AMD NZCH 062228Z 062212
VRB02KT 20KM -SHRA SCT015 BKN025
BECMG 2224 06015KT
TEMPO 2208 BKN012
TEMPO 0812 2500 DZ BKN007
2000FT WIND 04020KT =

* Amended Aerodrome Forecast for Christchurch issued at 1028 hours NZST on 7 August, valid from 1000 hours until 0000 hours NZST. Wind 02 knots variable direction, visibility 20 km. Light showers of rain could be expected. Cloud scattered (3–4 oktas) at 1500 ft AGL and broken (5–7 oktas) at 2500 ft AGL. During the period between 1000 hours and 1200 hours NZST, a change in the wind to 060T at 15 knots was forecast. Temporarily (for periods of less than one hour), between 1000 hours and 2000 hours NZST, cloud broken (5–7 oktas) at 1200 ft AGL. Temporarily (for periods of less than one hour), between 2000 hours and 0000 hours NZST, visibility 2500 m in moderate drizzle, cloud broken (5–7 oktas) at 700 ft AGL. 2000 ft wind 040T at 20 knots.

- 1.7.3 This meteorological information was indicating that conditions were satisfactory for the pilot's planned flight through the Nelson and Woodbourne area. However, the information relating to the Christchurch area was indicating that the weather would be marginal for a flight conducted under visual flight rules as prescribed by CAR 91.301. The light winds forecast and the temperature and dew point being

equal indicated a high humidity that would have probably resulted in low cloud existing in the area. This was reflected in the Christchurch SPECI which mentioned the observation of fog.

- 1.7.4 When making the IFIS request the pilot did not request ARFORs (Area Forecasts). The *Tasman and Straits* ARFORs were both forecasting visibility between 30 km and 6000 m in showers and rain with cloud bases above 2000 ft AMSL. However the ARFORs were forecasting less favourable conditions in the *Kaikoura* area with visibility reducing to 3000 m in rain and the cloud base lowering to 1000 ft AMSL.
- 1.7.5 The *Plains* (Canterbury) ARFOR was forecasting visibility reducing to 2500 m in rain and drizzle and reducing to 400 m in fog. Cloud was forecast to be BKN ST (Stratus) at 300 ft AMSL with rain and drizzle, otherwise BKN CUSC (cumulus and stratocumulus cloud) between 1200 ft and 8000 ft AMSL. Had the pilot requested the ARFORs it would have been clear to him that the conditions would deteriorate as he progressed toward Christchurch.
- 1.7.6 At 1229 hours NZST on 7 August 2005 the MetService¹ issued an amended TAF for Christchurch and numerous METARs and SPECIs, which would have been available to the pilot on request using IFIS prior to departure from Nelson Airport Tower ATC at the time of departure, and from ATS during the flight depending upon the availability of VHF radio reception.
- TAF AMD NZCH 070029Z 070012
06012KT 20KM -DZ SCT012 BKN025
TEMPO 0008 4000 DZ BKN007
TEMPO 0812 2500 DZ BKN003
2000FT WIND 04020KT
- * Amended Aerodrome Forecast for Christchurch issued at 1229 hours NZST on 7 August, valid from 1200 hours until 0000 hours NZST. Wind 12 knots from 060T, visibility 20 km, and light drizzle. Cloud scattered (3–4 oktas) at 1200 ft AGL and broken (5–7 oktas) at 2500 ft AGL. Temporarily (for periods of less than one hour), between 1200 hours and 2000 hours NZST, visibility 4000 m in moderate drizzle, cloud broken (5–7 oktas) at 700 ft AGL. Temporarily (for periods of less than one hour), between 2000 hours and 0000 hours NZST, visibility 2500 m in moderate drizzle, cloud broken (5–7 oktas) at 300 ft AGL. 2000 ft wind 040T at 20 knots.
- 1.7.7 The weather at Nelson, when the pilot departed at 1342 hours, was good. The METAR for Nelson issued at 1300 hours described a light northerly wind from 350° at 2 knots, with 50 km visibility and few clouds at 5000 ft, scattered (3–4 oktas) cloud at 11,000ft and broken (5–7 oktas) cloud at 26,000 ft.
- 1.7.8 The pilot did not request updated weather information from IFIS or the Nelson ATC before his departure nor did he make any radio transmissions after departing

¹ Trading name of the Meteorological Service of New Zealand Limited

from the controlled airspace at Nelson. The Nelson ATC and the Christchurch ATS FIO (when reception was available) could broadcast, on request, the latest updated weather updates for Christchurch Airport and any reported en route weather conditions to the pilot, irrespective of SARWATCH status.

- 1.7.9 Reports from witnesses in the locality of Waipara indicated that a bank of low cloud and fog existed along the coast at the area of the Waipara River mouth and extending out to sea. The cloud also extended inland by approximately one or two kilometres.
- 1.7.10 Three aircraft are known to have passed by the area of the accident site in the hours before and after the accident, the pilots were able to provide the following firsthand accounts of the weather in the area where the accident occurred:
 - 1.7.11 One pilot departed Christchurch at 1145 hours intending to fly out to the east coast. He described the visibility as being very limited around and north of the Waipara River mouth area. He therefore proceeded north via an inland route and tried to reach the coast via the Hurunui River but he was forced to turn around again overhead State Highway One, finally reaching the coast near Conway Flat, 20 km to the southwest of Kaikoura.
 - 1.7.12 Another pilot who approached the Waipara River Mouth from the north, approximately 40 minutes before the accident, described how the cloud was on the ridge tops from the Hurunui River to the foothills, 1 nm north of the Waipara River mouth. This created a small zone of visibility. However, toward the south past this point he observed that the cloud base lowered considerably to about 300 ft AMSL extending to approximately 2 km south of Amberley Beach. The visibility in the area became so poor that he elected to turn around and track back to the area of relatively clear visibility just north of the Waipara River. He was then able to divert and take an inland route to Christchurch Airport.
 - 1.7.13 The third pilot arrived at the mouth of the Waipara River from the north at about 1631 hours, some 75 minutes after the accident. He described the weather and visibility in the area as very poor and reported that he had to find a hole in the cloud through which to climb. He observed that the fog in the area was down to the sea surface.

1.8 Aids to navigation

- 1.8.1 Nil

1.9 Communications

- 1.9.1 The aircraft was equipped with a VHF radio; however the pilot's only known communications with ATS during the flight were those required at Nelson Airport where his last transmission at 1350 hours was to advise Nelson Tower that he was at Peppin Island and had cleared controlled airspace.
- 1.9.2 The pilot had not filed a flight plan with ACNZ for the flight on the day of the accident, nor was he required to.

1.9.3 VHF communication for weather updates from the ATS FIO on 121.3 MHz would have been available at all altitudes until a point just south of Kaikoura where, on changing the radio frequency to 124.4 MHz, communications would have been lost for the altitude at which ZK-FGS was flying. Contact with the ATS FIO could only have been possible at this stage of the flight from above approximately 2000 ft AMSL. This ‘blind spot’ would have existed until south of Motunau Island where contact with the ATS FIO could be regained irrespective of altitude.

1.10 Aerodrome information

1.10.1 Not applicable.

1.11 Flight recorders

1.11.1 Not applicable.

1.12 Wreckage and impact information

1.12.1 The main portion of the wreckage, including flight control or engine/propeller components were unable to be located, however several small pieces of wreckage were washed ashore over the weeks following the accident, which included both main wheels, pieces of fibreglass fairings and numerous pieces of aircraft structure and skin.

1.12.2 Examination of the wreckage revealed that significant tearing and impact deformation existed. This is consistent with a very high speed hydrodynamic impact.

1.13 Medical and pathological information

1.13.1 Post-mortem examination of the occupants revealed that death was due to high energy traumatic injury. The toxicology reports indicate nothing remarkable.

1.14 Fire

1.14.1 No evidence of in-flight fire was discovered.

1.15 Survival aspects

1.15.1 ZK-FGS was equipped with a radar transponder and altitude encoder. Examination of radar data recorded by ACNZ revealed that the transponder had been selected to Mode C², displaying the standard VFR code of 1200 throughout the flight. Although the pilot did not utilise a radar service at any stage, the radar data had been recorded routinely and was initially retrieved to aid the SAR effort. The last return containing Mode C information was at 1705:08 hours, the indicated altitude was zero feet at a location about one nautical mile offshore

² Altitude reporting mode of secondary surveillance radar.

adjacent to the Waipara River mouth which was where the aircraft was likely to have struck the sea surface.

- 1.15.2 No indication of the emergency transponder code 7700 having been selected was found on the radar recording. Selection of this code if the aircraft was at a suitable altitude with no terrain masking of the radar signal would cause an emergency alert to be visible on ATC radar displays and would prompt ATS personnel to activate emergency and search and rescue procedures immediately
- 1.15.3 The life preservers carried in ZK-FGS were found on the shoreline soon after the accident. Further examination revealed that they had not been inflated. This is consistent with other evidence available which suggests that the magnitude of the impact with the sea surface was so great that there was no likelihood of survival.
- 1.15.4 No ELT signal was detected. It is unlikely that the ELT system survived the high energy impact with the sea.
- 1.15.5 The accident was not survivable.

1.16 Tests and research

- 1.16.1 Not applicable.

1.17 Organisational and management information

- 1.17.1 Not applicable.

1.18 Additional information

- 1.18.1 Nil.

1.19 Useful or effective investigation techniques

- 1.19.1 The flight track data electronically recorded by the Garmin GPSMAP 269 receiver was able to be recovered from it by the manufacturer. This data was then able to be displayed electronically onto a map of New Zealand. This showed graphically all the flights on which the GPS unit had been carried since 19 February 2005. Many of the parameters for the final flight, such as heading, height and groundspeed for each of the data plots, were able to be closely examined.
- 1.19.2 The final full data plot indicated by the GPS receiver data presented a groundspeed of 215 knots and a 74° heading change within the preceding two seconds. However, this data plot, and the following altitude only plot are considered to be erroneous. The indicated groundspeed would not have been achievable by this type of aircraft under any circumstances. This erroneous reading possibly could be a result of loss of the satellite signal due to unusual aircraft attitude.

2. Analysis

- 2.1 The weather information that the pilot obtained prior to takeoff forecast marginal VFR conditions during the latter part of the planned flight south of Kaikoura. The pilot did not recheck IFIS for updated information prior to take off, or request an update from ATC at Nelson. This may have resulted in an incorrect perception of the actual conditions that he would encounter en route and at his destination. The updated weather information available from IFIS and ATS clearly described weather conditions not meeting the meteorological minima for the intended VFR flight.
- 2.2 Once confronted with the lowering cloud base and reducing visibility south of Motunau Island, it appears that, rather than turn back, the pilot may have elected to press on into the deteriorating weather conditions, eventually flying well below the minimum safe altitude of 500 ft AMSL prescribed by CAR 91.311, probably in an attempt to fly under the cloud. Having not refuelled since Wanganui, it is possible that the decision to attempt to complete the flight was influenced by a perception of insufficient fuel to divert. However, it appears that from Motunau Island the pilot could have been able to successfully divert to Kaikoura, and approximately 20 minutes of fuel would have remained in the aircraft fuel tanks at the time of landing.
- 2.3 It is likely that the pilot was not able to maintain distance from the cloud, even at low altitude, and the planned VFR flight likely encroached into IMC. The VFR minima prescribed by CAR 91.301 require that, for the class of airspace and altitude at which this flight was being conducted, the pilot must remain clear of cloud, have a flight visibility of 5 km, and be in sight of the surface.
- 2.4 It appears that the pilot had not configured the aircraft for bad weather. A reduction in airspeed to below flap speed and selection of flap at the appropriate moment would have allowed the pilot more time to consider his options and react to any developing situation.
- 2.5 The GPS track data shows that, at 1514.50 hours and at approximately 300 ft AMSL, the aircraft started a steady 180°/min (3°/sec) left turn. This is a 'rate one' turn which is classed as a 'standard' turn. During this 20 second duration turn the aircraft descended 100 ft reaching the lowest recorded altitude of approximately 180 ft AMSL at 1515.17 hours. Then a climbing turn of 240°/min was commenced gaining approximately 140 ft in altitude over the following ten seconds reaching approximately 320 ft AMSL. The climb rate averaged approximately 850 ft/min and the turn rate was a little tighter than rate one turn, resulting in an estimated 20° bank angle. The groundspeed remained above 125 knots throughout the complete turn. The turn was made in a seaward direction thus reducing or completely eliminating any possible visual contact that the pilot may have had with the ground or the horizon.
- 2.6 The aircraft was equipped with instruments required for flight in IMC; however the pilot was not qualified to fly in IMC. Whilst performing this climbing turn, in poor weather, with little or no external visual reference, the pilot probably suffered a type of sensory illusion called 'spatial disorientation', which is the

inability of the pilot to correctly interpret the attitude and position of his aircraft with respect to the earth's surface. This means simply that the pilot cannot tell which way is 'up'.

- 2.7 Where external visual references do not exist during flight in IMC, pilots who are proficient in instrument flying use strict standard operating procedures. They maintain a constant scan of all of the primary flight instruments. This counteracts any potential inadvertent response to strong signals from the dominant sensory perception mechanisms of the body such as the vestibular apparatus, (organs in the inner ear used for motion sensing), which can be a significant factor in why pilots become spatially disorientated. During PPL(A) training the student must demonstrate an ability to fly using instruments alone, however the PPL student is primarily trained to look outside the aircraft for visual reference. A 'visually' proficient pilot would find flight in IMC to be a very demanding and stressful situation and would tend to look outside the aircraft for reference, particularly in partial IMC, even in an aircraft which is fully IFR equipped.
- 2.8 The tendency of pilots who are becoming unknowingly spatially disoriented, is generally to progressively apply control inputs to correct a perceived adverse aircraft attitude. This can result in departure from controlled flight before the pilot realises, and can react to, what is occurring. This effect is exacerbated when the aircraft is climbing, descending, turning or accelerating. A spiral dive will rapidly ensue if control is not recovered quickly and, depending on the conditions at the time, the pilot may be unable to regain a sense of orientation. This is particularly hazardous if this occurs at a low altitude. Then, impact with the ground, or in this case the sea, is almost inevitable.

3. Conclusions

- 3.1 The pilot was not appropriately licensed for the flight, as his medical certificate had recently expired.
- 3.2 The aeroplane had a valid Airworthiness Certificate and had been maintained in accordance with the rules currently in force.
- 3.3 The pilot probably had an inaccurate perception of the actual weather en route.
- 3.4 The pilot continued to fly at low altitude into the deteriorating weather.
- 3.5 During a climbing turn in an area where poor horizon and surface definition probably existed, the pilot lost control of the aircraft, probably whilst spatially disorientated, at an altitude lower than that required to permit a successful recovery.

4. Safety Actions

- 4.1 The January/February 2006 CAA *Vector* safety publication, which is issued to all document holders, contained an article "178 Seconds to Live". This article

examines the consequence of “risky weather decisions” and explains the phenomenon of spatial disorientation.

5. Observation

- 5.1 The investigation revealed that, on the day of the accident, other pilots conducting private VFR flights along the east of the South Island had also been pressing on into conditions where they could not comply with the prescribed VFR minima, flying at low level in an attempt to remain clear of cloud and penetrate through the weather system. It appears that this may be a common practice in certain sectors of the aviation community, and should be actively discouraged.

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