NO. 95-005

CESSNA 152 II

ZK-FJX

MATAKANA

2 APRIL 1995

ABSTRACT

At approximately 1425 hours on Sunday 2 April 1995 a Cessna 152 aircraft, ZK-FJX stalled at a low height, dropped the left wing and collided with the terrain, near Matakana some 7 km north-east of Warkworth. The pilot and passenger lost their lives in the accident. The safety issue discussed relates to the need for pilots to resist the temptation to conduct impromptu low level flying The causal factors were failure to maintain a safe height above the terrain and inexperience in low flying.

TRANSPORT ACCIDENT INVESTIGATION COMMISSION

AIRCRAFT ACCIDENT REPORT NUMBER 95-005

Aircraft Type, Serial Number and Registration:	Cessna 152 II, 152 84022, ZK-FJX
Number and Type of Engines:	One Lycoming 0235-L2C
Year of Manufacture:	1979
Date and Time:	2 April 1995, 1425 hours*
Location:	4 nm north-east of Warkworth Latitude: 36° 20′S Longitude 174° 43′E
Type of Flight:	Private, Local scenic
Persons on Board:	Crew: 1 Passengers 1
Injuries:	Crew: 1 Fatal Passengers: 1 Fatal
Nature of Damage:	Aircraft destroyed
Pilot-in-Command's Licence:	Private Pilot Licence (Aeroplane)
Pilot-in Command's Age:	31
Pilot-in-Command's Total Flying Experience:	148 hours
Information Sources:	Transport Accident Investigation Commission field investigation
Investigator in Charge:	R Chippindale

*All times in this report are in NZST (UTC + 12 hours)

1. NARRATIVE

1.1 At 1318 hours on Sunday 2 April 1995 ZK-FJX, a Cessna 152 aircraft, departed Ardmore for a private flight to the north. On board were the pilot and one passenger.

1.2 The passenger was a friend of the pilot. She lived near Warkworth and had left her car at the nearby Kaipara Flats Aerodrome prior to the flight.

1.3 The pilot filed an abbreviated flight plan to leave Ardmore via Clevedon and terminated the flight plan once clear of the Control Zone.

1.4 No further reports were received from the pilot by Air Traffic Control. The aircraft was seen by the Auckland Radar however and the record of its flight path plotted in the course of the investigation. The aircraft transponder was not picked up by the radar at altitudes below 400 feet and the time it spent below that altitude could not be determined.

1.5 Attention was drawn to the aircraft at about 1410 hours when it was seen in a persistent bout of low flying focused on the passenger's residence. The low flying caused disturbance to some stock and annoyance to several residents by virtue of its duration for some 10 to 15 minutes.

1.6 As the aircraft passed over the passenger's house for the last time a witness there believed that she saw and heard it hit a tall bluegum tree. Examination of the trees in the area revealed a freshly broken branch near the top of the tree. Another witness also believed that the aircraft hit the tree. A subsequent examination of ZK-FJX however failed to reveal any confirmation of this tree strike.

1.7 The passenger's children were present on her property as the aircraft made its low passes over the area.

1.8 Following the low pass over the trees the aircraft continued flying for about 1nm to the south-east. Immediately prior to the accident it was seen to pitch up as if to clear a shelter belt. At the top of the resultant climb the engine noise reduced and the aircraft's nose dropped following which the aircraft went out of sight of the witnesses and the sound of an impact with the ground was heard.

1.9 The aircraft was reported as following a pattern in the low flying over the area of orchards in which the accident occurred. This pattern involved a pull up over each shelter belt on its track, a reduction in engine noise as the aircraft neared the top of the climb, a dive into the sheltered area and climb away over the next shelter belt. This type of manoeuvre was flown both before and after the reported collision with a tree.

1.10 The aircraft collided with the ground in a 60° left bank and an angle of descent of some 45°. As the left wing tip hit the ground the aircraft cartwheeled through approximately 90° and stopped in line with the initial impact point, with the engine almost fully embedded in the soft ground of the mandarin orchard where it came to rest.

1.11 The resultant reduction of occupied space caused by the collapse of the forward cabin structure negated the effectiveness of the occupants upper body restraints which were attached near the top of the cabin. The occupants upper body contact with the instrument panel area made the accident unsurvivable.

1.12 Examination of the wreckage established that the elevator and rudder control runs were correctly attached and free to operate prior to the accident. The pre-accident integrity of the aileron control system could not be confirmed due to the severity of the damage adjacent to the control wheels but there was no obvious indication of any failure or pre-impact damage which may have prevented the pilot from exercising full aileron control.

1.13 The propeller blades exhibited damage typical of a "power-on" impact with soft ground.

1.14 The aircraft's altimeter was damaged in the accident and the subscale setting moved by rotation of the setting knob during the impact sequence and/or the subsequent recovery of the victims.

1.15 Some 15 litres of fuel remained in the damaged right tank. The aircraft's fuel system is such that at least a similar quantity was probably present in the left tank before it was ruptured in the accident. As both tanks were punctured in the accident this was not a reliable indication of the quantity of fuel present prior to impact.

1.16 The examination of the wreckage suggested that if there was an impact with the tree branch it did not damage the aircraft's aerodynamic control system or the engine/propeller combination.

1.17 The path taken by the aircraft following the apparent collision was not consistent with an attempt to make a controlled forced landing as it was toward an area dissected by shelter belts and the aircraft was heading down wind. The length of the flight suggested that no immediate loss of control ensued and the pull up over the shelter belt immediately prior to the accident appeared to be of a similar pattern to earlier manoeuvres in the low flying sequence.

1.18 The weather on the day of the accident was partly overcast with broken cumulus cloud at about 3500 feet base and a light northerly wind. Visibility was good beneath the cloud and there was no precipitation.

1.19 The pilot had completed a Private Pilot Licence (PPL) Course with the training organisation which owned the aircraft and was continuing his training with the organisation to achieve a Commercial Pilot Licence. He was assessed as mature in his conduct and approach to flying with no previous indication of irresponsibility during his flying training. A recent handling check by the Chief Flying Instructor on 24 March 1995 classed his performance as "Generally rusty on most procedures. ...Overcontrols on most manoeuvres, and needs to settle this with advanced training maybe aeros. (aerobatics)".

1.20 He had not been given any dual instruction in low flying since the completion of his training for his PPL but had attended a briefing on the subject given by an instructor who was undergoing an instructor rating upgrade. As this briefing was not related to any flying the pilot was intended to carry out he may not have given the briefing the same degree of attention that would apply for one preceding a flight he was about to undertake.

1.21 Although the pilot did not state that he intended to land at Kaipara Flats Aerodrome during the course of the flight this was probably his intention. The passenger's car had been parked there earlier and a Visual Flight Guide found in the aircraft was open at the page for the Kaipara Flats Aerodrome. Had the aircraft's owners known that the pilot intended such a landing this would have caused them no concern and the pilot needed no permission from them to carry out such a landing.

1.22 In summary the investigation indicated that the pilot's bout of low flying was out of character and a spur of the moment decision prompted by the presence of his passenger.

1.23 The pattern of a sequence of pull up, pitch down manoeuvres at a low height over a series of shelter belts was particularly foolhardy and the evidence of the impact indicates that in the course of one such manoeuvre the aircraft stalled, dropped the left wing and collided with the ground before the pilot could retrieve the situation.

2. FINDINGS

2.1 ZK-FJX had a valid Certificate of Airworthiness and Maintenance Release.

2.2 ZK-FJX had been maintained correctly.

2.3 ZK-FJX was airworthy and had been functioning correctly at the time of the accident.

2.4 If the aircraft did hit a tree this had no effect on the outcome of the flight.

2.5 ZK-FJX's weight and balance were within limits.

2.6 The pilot was appropriately qualified to conduct the flight with a passenger.

2.7 The aircraft was flown below the authorised minimum height for a sustained period.

2.8 The pilot had only his PPL experience in low flying.

2.9 The pilot was not authorised for low flying.

2.10 The area in which the flight was conducted was not an approved low flying area.

2.11 The pilot made an out of character decision which jeopardised the safety of his passenger, his aircraft, and persons and property on the ground.

2.12 The manoeuvres performed by the pilot while low flying were likely to have resulted in a stall and loss of control.

2.13 The accident resulted from a stall at a height which left the pilot no opportunity to recover.

2.14 The accident was unsurvivable.

16 August 1995

M F Dunphy
Chief Commissioner

GLOSSARY OF AVIATION ABBREVIATIONS

AD	Airworthiness Directive
ADF	Automatic direction-finding equipment
agl	Above ground level
AI	Attitude indicator
AIC	Aeronautical Information Circular
AIP	Aeronatical Information Publication
amsl	Above mean sea level
AOD	Aft of datum
ASI	Airspeed indicator
ATA	Actual time of arrival
ATC	Air Traffic Control
ATD	Actual time of departure
ATPL (A *or* H)	Airline Transport Pilot Licence (Aeroplane *or* Helicopter)
AUW	All-up weight
°C	Degrees Celsius
CAA	Civil Aviation Authority
CASO	Civil Aviation Safety Order
CFI	Chief Flying Instructor
C of G (*or* CG)	Centre of gravity
CPL (A *or* H)	Commercial Pilot Licence (Aeroplane *or* Helicopter)
DME	Distance measuring equipment
E	East
ELT	Emergency location transmitter
ERC	Enroute chart
ETA	Estimated time of arrival
ETD	Estimated time of departure
°F	Degrees Fahrenheit
FAA	Federal Aviation Administration (United States)
FL	Flight level
ft	Foot/feet
g	Acceleration due to gravity
GPS	Global Positioning System
h	Hour
HF	High frequency
hPa	Hectopascals
hrs	Hours

IAS	Indicated airspeed
IFR	Instrument Flight Rules
IGE	In ground effect
ILS	Instrument landing system
IMC	Instrument meteorological conditions
in	Inch(es)
ins Hg	Inches of mercury
kg	Kilogram(s)
kHz	Kilohertz
KIAS	Knots indicated airspeed
km	Kilometre(s)
kt	Knot(s)
lb	Pounds
LF	Low frequency
LLZ	Localiser
Ltd	Limited
m	Metre(s)
M	Mach number (e.g. M1.2)
°M	Degrees Magnetic
MAANZ	Microlight Aircraft Association of New Zealand
MAP	Manifold absolute pressure (measured in inches of mercury)
MAUW	Maximum all-up weight
METAR	Aviation routine weather report (in aeronautical meteorological code)
MF	Medium frequency
MHz	Megahertz
mm	Millimetre(s)
mph	Miles per hour
N	North
NDB	Non-directional radio beacon
nm	Nautical mile
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board (United States)
NZAACA	New Zealand Amateur Aircraft Constructors Association
NZDT	New Zealand daylight time (UTC + 13 hours)
NZGA	New Zealand Gliding Association
NZHGPA	New Zealand Hang Gliding and Paragliding Association
NZMS	New Zealand Mapping Service map series number
NZST	New Zealand Standard Time (UTC + 12 hours)
OGE	Out of ground effect
okta	Eighths of sky cloud cover (e.g. 4 oktas = 4/8 of cloud cover)
PAR	Precision approach radar
PIC	Pilot in command
PPL (A *or* H)	Private Pilot Licence (Aeroplane *or* Helicopter)
psi	Pounds per square inch

QFE	An altimeter subscale setting to obtain height above aerodrome
QNH	An altimeter subscale setting to obtain elevation above mean sea level
RNZAC	Royal New Zealand Aero Club
RNZAF	Royal New Zealand Air Force
rpm	revolutions per minute
RTF	Radio telephone or radio telephony
s	Second(s)
S	South
SAR	Search and Rescue
SSR	Secondary surveillance radar
°T	Degrees True
TACAN	Tactical Air Navigation aid
TAF	Aerodrome forecast
TAS	True airspeed
UHF	Ultra high frequency
UTC	Co-ordinated Universal Time
VASIS	Visual approach slope indicator system
VFG	Visual Flight Guide
VFR	Visual flight rules
VHF	Very high frequency
VMC	Visual meteorological conditions
VOR	VHF omnidirectional radio range
VORTAC	VOR and TACAN combined
VTC	Visual terminal chart
W	West