

AIRCRAFT ACCIDENT REPORT
OCCURRENCE NUMBER 06/4354
AMATEUR-BUILT SMYTH MODEL S SIDEWINDER
ZK-DYY
MOUTH OF THE KAIPARA HARBOUR, NEAR POUTU POINT
25 NOVEMBER 2006



Glossary of abbreviations used in this report:

AGL	above ground level
AIP	Aeronautical Information Publication
BFR	Biennial Flight Review
CAA	Civil Aviation Authority
FOD	foreign object damage
GP	General Practitioner
kg	kilogram/s
kts	knots
LED	light-emitting diode
M	magnetic
MBZ	mandatory broadcast zone
mg	milligrams
MHz	megahertz
MSL	mean sea level
NOK	Next Of Kin
NZDT	New Zealand Daylight Time
PPL	Private Pilot Licence
VFR	visual flight rules
VNC	visual navigation chart
VNE	velocity never exceed
USA	United States of America
UTC	Coordinated Universal Time
WGS 84	World Geodetic System 1984

AIRCRAFT ACCIDENT REPORT

OCCURRENCE No 04/4354

Aircraft type, serial number and registration:	Amateur-Built Smyth Model S Sidewinder, AACAA/184, ZK-DYY
Number and type of engines:	1 Lycoming O-320-A2A
Year of manufacture:	1994
Date and time:	25 November 2006, 0850 hours ¹ (approx)
Location:	Mouth of the Kaipara Harbour, near Pouto Point Latitude ² : S 36° 23.36' Longitude: E 174° 08.75'
Type of flight:	Private
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:	56 years
Pilot-in-command's total flying experience:	910 hours, 4.5 on type (approx)
Information sources:	Civil Aviation Authority field investigation
Investigator in Charge:	Mr A M Moselen

¹ All times in this report are NZDT (UTC + 13 hours)

² WGS 84 co-ordinates

Synopsis

The Civil Aviation Authority was notified of the accident at approximately 1145 hours on 25 November 2006. The Transport Accident Investigation Commission was in turn notified, but declined to investigate. A CAA site investigation was commenced the next day.

The aircraft was climbing away after take-off from the Kaipara Harbour North Head beach when it was observed to suddenly bank to the left, pitch nose down and dive into the sea. Both occupants were killed in the accident.

1. Factual information

1.1 History of the flight

- 1.1.1 At 1824 hours on Friday 24 November 2006, the pilot and a passenger departed Ardmore Airfield in ZK-DYY on a flight bound for Springhill, a private airfield near Wellsford, Northland. The purpose of the flight was to attend a “fly in” there over the weekend.
- 1.1.2 At approximately 1945 hours, two recreational fishermen saw a small aircraft flying low through a heavy rain shower past their position on the North Head of Kaipara Harbour. When interviewed, they related that the aircraft appeared to have come from the north and was flying toward Poutu Point. When the fishermen were returning home they noticed the same aircraft on the beach. The pilot told the fishermen that he had become lost and had decided to land before dark. They then assisted the pilot to move the aircraft above the high tide mark.
- 1.1.3 The fishermen remarked that the pilot, and in particular the passenger had appeared to be distressed from the experience, but both turned down an offer of a lift to nearby Dargaville. They also noted that whilst the aircraft did not appear to have been damaged, an unusual looking door like structure was protruding down below the fuselage.
- 1.1.4 The pilot and passenger camped on the beach that night and at some time prior to the accident the next morning, the pilot received a cell phone call from a concerned friend (fellow pilot). The pilot told his friend that he was standing on a beach looking out at Great Barrier Island.
- 1.1.5 At approximately 0800 hours, 25 November 2006, a Poutu Point resident assisted the pilot to tow the aircraft onto firm sand. The resident recalled that when tying a rope on to the nose landing gear he noted a large flap like structure hanging down below the fuselage. He also commented that the pilot appeared anxious to depart the beach but was still uncertain of his position. When it was explained where he actually was using the pilot’s aeronautical map (VNC Chart), the revelation was met with disbelief by the pilot. The resident also recalled that no flight preparation navigation lines were drawn on the chart.
- 1.1.6 The pilot started and taxied the aircraft to a takeoff point aligned 220° M and directly into a brisk south-westerly wind. Two local residents who witnessed the flight described hearing an increase in engine noise and then watched the aircraft

become airborne in approximately 300 metres. One of the residents took photographs (Refer Figures 1, 2, and 3). Each photograph depicts the aircraft's speed-brake, which protrudes below the fuselage, in an extended position.

- 1.1.7 The aircraft was further observed to climb away until approximately 300 feet AGL where it was described that the aircraft's attitude appeared to steepen markedly. Shortly after, the aircraft suddenly banked to the left, and then pitched nose down. The aircraft did not recover and it dived into the sea some 100 metres off the beach with the engine, according to eye witnesses, "as still roaring". The aircraft floated upright initially but turned over and sank after about 30 minutes. Rescue services that attended the scene found both occupants had not survived the accident.
- 1.1.8 The accident occurred in daylight, at approximately 0850 hours, in the sea off the foreshore of North Head, Kaipara Harbour, latitude S 36° 23.36', longitude E 174° 08.75'.



PRESTART
Figure 1



TAKEOFF
Figure 2



CLIMB
Figure 3

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, aged 56 years, held a Private Pilot Licence (Aeroplane), and a current Class 2 Medical Certificate. Active conditions on the licence were as follows:

- Half spectacles must be readily available.
- Contact lens must be worn.
- Spare spectacles must be readily available.

1.5.2 Up until 3 November 2006, the pilot had flown a total of 910 hours. His BFR was completed on 3 November 2006 and was conducted in a Cessna 172. His total flying time on ZK-DYY amounted to four hours and twenty minutes. One hour was flown for the issue of the type rating; the remaining hours were flown about the Ardmore area including two cross country flights between Ardmore and Thames.

1.5.3 The pilot's New Zealand flight experience commenced in 1992. At that time, 576 hours from flying overseas had been transferred into his logbook. Of those hours 36 were attributed to flying multi-engine aircraft and 65 hours were simulated instrument time.

1.5.4 Prior to purchasing ZK-DYY, the pilot had owned and operated a number of single and multi-engine aircraft. His total multi-engine time experience in New Zealand amounted to 138 hours, 10 of those were flown at night. His single engine aircraft experience in New Zealand amounted to 205 hours, 41 of those were flown at night.

1.6 Aircraft information

- 1.6.1 The aircraft, known as a Smyth Model S Sidewinder, was designed in the USA in 1958, and plans were made available to amateur constructors in 1969. It is of all metal construction providing seating for two people in a side-by-side arrangement. The construction of ZK-DYY, serial number AACCA/184 commenced in New Zealand in 1974 and was completed in December 1994 by a previous owner.
- 1.6.2 The aircraft was fitted with conventional flight controls, but had no wing flaps. Slowing the aircraft was achieved by extending a speed brake that was mounted underneath the main fuselage, between the main landing gear. During flight, the brake created drag when extended. One owner/operator commented that he only used the brake during landing and only when on the runway. Others remarked that use of the speed brake was common among owners and was usually selected during the landing phase below 100 knots. In addition they considered the speed brake not to be flight critical and therefore it was not included as an item in checklists.
- 1.6.3 The ZK-DYY manufacturers test flight report was reviewed. No dangerous or undesirable characteristics were found during the test schedule. The tests included stall and landing overshoots with the speed brake fully extended.
- 1.6.4 In terms of the aerodynamic stall, comments on the stall entry by one Smyth Sidewinder owner indicated that plenty of warning (buffet) and a gentle pitch-over was experienced. However, another owner of the aircraft type commented that stall entry was sudden and with a brisk left wing drop. With the speed brake extended, the stall characteristics were described similarly except that stall entry occurred at a slightly higher airspeed.
- 1.6.5 Engine power was provided by a Lycoming O-320-A2A, serial number L2667-27 engine, driving a Sensenich two-bladed wooden propeller. The metal fuel tank was mounted in the aircraft's nose section, between the engine fire wall and the forward instrument panel.
- 1.6.6 Cockpit instrumentation and controls were typical of a single engine light aircraft. Some notable differences were the stall warning system which incorporated a red indicator light (no aural warning), and the speed brake open and closed position indicator consisted of red and green LED lights. The lights were positioned low, and to the extreme left of the forward main instrument panel. In addition, the navigational capability was limited to a magnetic compass and turn co-ordinator.
- 1.6.7 Information regarding the performance specifications for the Smyth Sidewinder was obtained from the aircraft's designer, other owner operators of the same aircraft type, and the test flight programme as follows:
- | | |
|------------------------|---------|
| Max operating weight | 700 kg |
| VNE | 175 kts |
| Max speed brake extend | 120 kts |
| Basic Stall speed | 48 kts |

Best rate of climb (Vy)	85 kts
Best angle of climb (Vx)	75 kts

- 1.6.8 The aircraft's total time in service up to October 2002 was 60 hours. No hours were recorded in the Aircraft Logbook or the Engine Logbook after that date. Further enquiries found that the aircraft was inactive between 2002 until 2006.
- 1.6.9 The aircraft had been maintained by a CAA Part 43 maintenance provider. The last maintenance inspection recorded for the aircraft was a 100 hour/annual inspection in June 2006. In addition an Annual Review of Airworthiness and a compass swing were carried out at the same time.
- 1.6.10 The aircraft had a valid Non-Terminating Airworthiness Certificate issued in June 2002, and had also changed ownership that same year. In October 2003 repairs were completed on the fuselage and main landing gear support structure after the aircraft incurred a landing accident in September 2002. In May 2006, aircraft ownership changed to the pilot involved in the fatal accident.
- 1.6.11 The engine had accrued 1367 hours since overhaul and had been previously used in another aircraft. When the engine was fitted into ZK-DYY the total hours amounted to 5762. The last recorded engine maintenance activity was a 100 hour/annual inspection in June 2006.
- 1.6.12 With respect to weight and balance, the exact weight at the time of the accident could not be determined. However, the aircraft had been flown on the previous day of the accident with a similar pay load and appeared to have taken off and landed without any reported loading problem. It was considered likely that the camping equipment and stores used during the over-night had been re-stowed in the aircraft in much the same location as the previous day, and that the aircraft therefore most probably remained within the approved centre of gravity limits.

1.7 Meteorological information

- 1.7.1 Satellite imagery and the MSL analysis from 1200 to 1900 hours on Friday 24 November 2006 indicated a cold front approaching Auckland from the south. The area forecast was for deteriorating weather conditions to occur during Friday afternoon 24 November. The weather forecast for the time the pilot departed Ardmore was for reduced visibility in rain and strengthening westerly winds. A review of the actual weather observations recorded at Auckland International Airport for 1800 and 1900 hours showed there were frequent rain showers, visibility was 2000 metres, and the wind was from a westerly direction with gusts up to 30 kts. Cloud cover was recorded as having been patchy at 2000 feet AGL.
- 1.7.2 Weather data from the Automatic Weather Station at Dargaville, Northland, for the time when ZK-DYY was in the area recorded northerly winds and rain showers.
- 1.7.3 On the morning of the accident flight, the weather forecast was for conditions to markedly improve. Winds were to remain fresh but from a more south-westerly direction. The photographs taken by the local resident appear to support the forecast (Figures 1, 2 & 3).

1.8 Aids to navigation

1.8.1 Not applicable.

1.9 Communications

1.9.1 On 24 November 2007, the pilot made three radio calls on Ardmore Unicom Traffic frequency (118.1 MHz). The calls pertained to lining up and taking off from the Ardmore runway being used, and a call advising local traffic of vacating the Ardmore area.

1.9.2 There were no other communications heard on any other frequency that were available for use during the flight. These frequencies included the Auckland MBZ (120.4 MHz), Whenuapai Tower (134.5 MHz), North Shore Aerodrome (118.0 MHz), Springhill, Dargaville or Ruawai Aerodromes on (119.1 MHz), and the emergency frequency (121.5 MHz). There were no radio calls made on the day of the accident flight.

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 According to witnesses, the aircraft struck the sea approximately 100 metres off the beach. The wreckage was later pulled out of the water by rescue services, and transported to a secure facility.

1.12.2 Wheel marks from the aircraft and some tent pegs were located on the beach area near the accident site the following day.

1.13 Medical and pathological information

1.13.1 Post-mortem examinations for both pilot and passenger determined that cause of death was from drowning associated with head injuries.

1.13.2 There was evidence of a single focus of narrowing of one of the coronary arteries of the pilot but there was no evidence of either a recent or previous heart attack.

1.13.3 Toxicological tests on the pilot found 1.1 mg per litre of Tegretol (carbamazepine) in his blood. This medication is routinely prescribed for epilepsy and other seizure disorders and occasionally for relief of certain pain disorders (e.g. trigeminal neuralgia- a specific pain disorder involving the face; glossopharyngeal neuralgia- a pain disorder involving the tongue, throat, ear and tonsils; and painful diabetic neuropathy).

1.13.4 Eight days prior to the accident, the pilot had visited a GP for the relief of shoulder and leg pain not responding to Panadol. He was diagnosed as having

neuralgic pain of the leg and a strained shoulder. He was prescribed 200mg tablets of Tegretol to be taken three times a day. The pilot was advised to take 100mg initially and then increase the dosage depending on the severity of pain. He was also advised of the possible side effects from the drug.

- 1.13.5 After the accident, the pilot's wife stated that he had taken one tablet a day up to five days prior to the accident and that there were no reported symptoms suggestive of side effects from the Tegretol. However, based on the level of Tegretol detected in the blood it was considered by the Pathologist that the pilot had been taking the medication up until the time of the accident.
- 1.13.6 Various medical articles describe Tegretol as being more than a simple pain reliever, and that it should not be prescribed for the relief of minor aches and pains. The drug can cause neurological side-effects including vision problems, fatigue and dizziness. Some cautions to observe until any affects are known is to be careful driving, operating machinery, or doing jobs that require you to be alert.
- 1.13.7 Twelve days prior to the accident, the pilot renewed his Class Two Medical Certificate. Aside from eye surgery when he was 21 years old, the pilot reported that he had experienced no other medical problems or recent visits to a health professional.

1.14 Fire

- 1.14.1 Fire did not occur.

1.15 Survival aspects

- 1.15.1 The pilot and passenger were wearing combined lap and shoulder harnesses (not inertia-reel type) at the time of the accident and both received critical head injuries from contact with the instrument panel. The pilot's shoulder harness was found to have failed from high energy overload at the swaged cable attachment, and the passenger's shoulder harness cable had torn from the rear bulkhead. It was considered that the failures were directly attributable to the high energy impact and not from any defect.

1.16 Tests and research

- 1.16.1 A detailed examination of the wreckage was conducted at a secure facility. Several loose items of equipment and cargo had been recovered separately in the water. These included volume four of the AIP, checklists, maps, headsets, camping gear and food items. Apart from the left wing, the aircraft had remained intact. No damage was found to the forward fuselage and windshield that could be associated with pre-impact strikes with birds or other objects. The fuselage, wings, and tail section of the aircraft revealed no evidence of any pre-impact failures or malfunctions.
- 1.16.2 Damage to the nose and left side of the aircraft reflected a nose-down, left wing-low attitude of the aircraft at water entry. The left wing had torn away from the wing attachment points during the impact sequence. It is considered by the

investigation that the entire damage pattern to the aircraft supported the eye witness accounts of the accident.

- 1.16.3 There were no indications there had been a mechanical malfunction of the engine. The wooden propeller was shattered in a manner that indicated it was rotating prior to impact. Although the fuel tank had ruptured and the contents lost to the sea, uncontaminated fuel was found in the carburettor.
- 1.16.4 Fracture surfaces and general damage found to flight control mechanisms were typically impact related. As far as practically possible, integrity was determined to have existed throughout the flight control mechanisms prior to the accident. The likelihood of a control problem caused by the presence of FOD was also eliminated.
- 1.16.5 Inspection of the speed brake mechanism determined that it had remained fully extended during the accident sequence. Friends of the pilot later commented that he had told them that he had been experiencing some difficulty with the system. The Aircraft Logbook however contained no information regarding any defect with the speed brake system.
- 1.16.6 Attempts were made to operate the speed brake in situ but impact forces had jammed the system completely. The system was removed from the aircraft to enable bench testing.
- 1.16.7 The control switch for the speed brake, a double pole, double throw on/off type had broken from impact forces. The LED indicator light wiring was detached and had extensive corrosion from sea water but the individual lights were found to be operational. Although contaminated with sea water, the electrical motor assembly which powers a hydraulic pump, had no defects that would have precluded normal operation. The armature of the motor assembly was rotated using a battery powered drill and the ram for the speed brake was successfully operated by hydraulics.
- 1.16.8 The stall warning red light cap was intact and the light bulb appeared undamaged. No useful information could be gained from the remaining instruments.

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 Nil

2. Analysis

- 2.1 From the investigation findings it would appear that the accident occurred after the aircraft entered an incipient spin having aerodynamically stalled when the aircraft was flown into a steep climb. As a consequence, it would have been difficult for the pilot to recover the aircraft in the height available. Given that the speed brake was extended at the time, the resultant drag probably affected the speed at which onset of the stall occurred.
- 2.2 Whilst there was anecdotal evidence indicating that the pilot may have been experiencing difficulty with the speed brake system, there were no speed brake system defects recorded in the Aircraft Logbook and the investigation testing indicated that the speed brake most likely would have operated normally on the preceding flight prior to the accident.
- 2.3 There is the possibility that the speed brake position indicator LED light(s) were not operating because the indicator circuit integrity could not be fully established. However, there was ample opportunity for the pilot to check his aircraft prior to take-off and he should have noticed during his pre-flight checks that the speed brake was in the fully open position.
- 2.4 Human Factors are prevalent in aircraft accident causation. It cannot be ruled out that side effects from the pilots medication contributed to the confusion as to his whereabouts- he could not have seen Great Barrier Island from his position- and to his over sight of the extended speed brake. It is also possible that the pilot's complaint of a sore shoulder and leg pain may have still persisted, providing a distraction to the pilot. His limited experience on the aircraft type is also noted.
- 2.5 Because of the dominance of human factors in this accident, lessons learnt remain with pilot education. It is often the case in such instances that the aircraft type, it's accompanying operating systems, procedures and checklists are perfectly adequate when maintained and operated as intended. Therefore, the investigation makes no recommendation that would seek changes to the aircraft, or operating procedures.

3. Conclusions

- 3.1 The aircraft had a valid Airworthiness Certificate and had been professionally maintained.
- 3.2 There were no unresolved defects with the aircraft or engine recorded in the maintenance records.
- 3.3 The possibility of a pre-existing defect with the airframe or engine that could have contributed to the accident was eliminated as far as practicable by the investigation.
- 3.4 The pilot did not carry out a thorough pre-flight prior to the accident.

- 3.5 The aircraft speed brake remained fully extended during the flight but this aspect did not directly contribute to the cause of the accident.
- 3.6 During a steep climb the aircraft aerodynamically stalled, entered an incipient spin and was not recovered in the height available.
- 3.7 The pilot was taking a medicinal drug for the treatment of pain.
- 3.8 The pilot's actions and lack of situational awareness may have been influenced by side effects from the medicinal drug and or a persistence of his medical complaint.

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