



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA/18/2/3/8426	
Aircraft Registration	ZU-ETF	Date of Accident	26 January 2008		Time of Accident	0939Z
Type of Aircraft	IKARUS-C42		Type of Operation	Aerial Survey		
Pilot-in-command Licence Type		Commercial	Age	25	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	229.2		Hours on Type	10.0
Last point of departure		Howick Aerodrome (FAHC)				
Next point of intended landing		Howick Aerodrome (FAHC)				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Between Howick and Underberg on a farm into the valleys of the hills: GPS position: S2935, 883 E03007, 835						
Meteorological Information		According to the SA Weather Service, the temperature was 26°C with visibility of 10 km or better and the surface wind was 120° True North @ 05 knots.				
Number of people on board	1 + 1	No. of people injured	0	No. of people killed	2	
Synopsis						
<p>On 28 January 2008, the aircraft took off for an aerial survey flight from Howick Aerodrome with the pilot and a surveyor on board. The survey was meant to include a number of observation points which were plotted on a GPS. The pilot was flying into a valley on a farm where he was following the contour of the earth from low to high ground and as he cleared the power-lines in front of his flight path, he was caught between two sections of the high terrain with no escape route.</p> <p>The aircraft crashed 10 minutes after take-off from Howick Aerodrome on a farm and was completely destroyed by the post-impact fire. The pilot and the surveyor both sustained fatal injuries.</p> <p>It appears possible that flying up the valley, the pilot may have been increasing the climb rate until the aircraft stalled.</p>						
Probable Cause						
<p>The aircraft entered a dead-end valley with rising terrain on both sides and was unable to clear the rising terrain.</p>						
IARC Date				Release Date		

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Spatial Intelligence (Pty) Ltd.
Manufacturer : COMCO IKARUS GMBH
Model : IKARUS C42B
Nationality : South Africa
Registration Marks : ZU-ETF
Place : Into the valley on a farm between Howick and Underberg.
Date : 26 January 2008
Time : 0939Z

All time given in this report is Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation:

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interests of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability.***

Disclaimer:

This report is given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 The aircraft with two occupants on board (the pilot and a surveyor), took off from Howick Aerodrome for an aerial survey flight. This was the second flight of the particular aircraft and its crew for the day. The flight commenced at Howick Aerodrome after a refuelling stop. The intended route was to Margate Aerodrome via Underberg and back to Howick.
- 1.1.2 The survey flight as planned included a number of observation points. Information from SiQ Management, as well as from discussions with the ground crew revealed that, according to the fuel records, the aircraft's fuel endurance was about four (4) hours on take-off.
- 1.1.3 The pilot was flying into a valley where he was following the contour from low to high ground. After the pilot had cleared the power-lines in front of his flight path, he then found himself caught between two sections of high terrain with no escape route. The evidence suggests that the rising terrain was more than the climb-rate capability of the aircraft.

1.3 Damage to Aircraft

1.3.1 The aircraft was destroyed by the impact and the post-impact fire.



1.4 Other Damage

1.4.1 There was fire damage caused to the vegetation around the accident site.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	25
Licence Number	*****	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Night Rating				
Medical Expiry Date	28 February 2008				
Restrictions	None				
Previous Accidents	None				

Flying Experience:

Note: The hours listed below were extracted from the pilot logbook and also from the pilot application form for his commercial licence.

Total Hours	229.2
Total Past 90 Days	18.4
Total on Type Past 90 Days	10.0
Total on Type	10.0

1.6 Aircraft Information

Airframe:

Type	C42B	
Serial Number	0704-6887	
Manufacturer	Ikarus	
Date of Manufacture	2007	
Total Airframe Hours (At time of Accident)	41.0	
Last MPI (Date & Hours)	13 Dec. 2007	23.3
Hours since Last MPI	17.7	
C of R (Issue Date)	08 November 2007	
Authority to fly (Issue Date) (Present owner)	30 Jan 2007 (valid for 1 year)	
Operating Categories	Standard	

Engine:

Type	Rotax 912 ULS
Serial Number	5-648267
Hours since New	41.0
Hours since Overhaul	Not reached

Propeller:

Type	Kiev (Ground Adjustable)
Serial Number	283125
Hours since New	41.0
Hours since Overhaul	Not reached

1.7 Meteorological Information

- 7.1 According to the information provided by the South African Weather Service, the following weather conditions were prevailing in the vicinity of the area where the accident took place:

Wind direction	120°	Wind speed	05 knots	Visibility	10 km
Temperature	26°C	Cloud cover	BKN	Cloud base	4000 ft AGL
Dew point	18°C				

1.8 Aids to Navigation

- 1.8.1 The aircraft had standard navigational equipment installed (Compass). The equipment was serviceable prior to the accident. No evidence could be found which indicated that the equipment became defective during flight.

1.9 Communications

- 1.9.1 The aircraft was equipped with the following standard communication equipment for the aircraft type:
- (a) Filser Radio
 - (b) Filser Transponder

1.10 Aerodrome Information

- 1.10.1 The accident took place away from an aerodrome in a valley at Glencall Farm. The GPS position at the accident site was as follows: S29°35", 883'' E03°007", 835'.

1.11 Flight Recorders

- 1.11.1 The aircraft was not fitted with a Cockpit Voice Recorder (CVR) or a Flight Data Recorder (FDR) and neither was required by regulations to be fitted to this type of aircraft.

1.12 Wreckage and Impact Information

- 1.12.1 When the aircraft impacted with the ground, a post-impact fire erupted and this destroyed the aircraft. Both occupants were fatally injured. Only a small section of the aircraft's tail section did not burn. The ground scars indicated that the aircraft's right-hand wing stalled first before the crash.



Photo 1 shows the valley where the accident happened.



Figure 2 shows the valley which the pilot was using as a guide (from the picture it shows that the pilot was following the contour of the earth up the mountain).

1.13 Medical and Pathological Information

1.13.1 The pilot was a holder of a valid Medical Certificate with an expiry date of 28/02/2008.

1.13.2 A post-mortem examination was performed on the deceased pilot and passenger after the accident. The results of the post-mortem report and toxicology tests were not available at the time when the report was compiled. Should any of the results, once received, indicate that medical aspects may have affected the performance of the flight crew members, this will be considered as new evidence and the investigation re-opened.

1.14 Fire

1.14.1 There was a post-impact fire which destroyed the aircraft. The origin of the fire could not be determined.

1.15 Survival Aspects

1.15.1 Due to the high impact forces and the destruction of the cockpit/cabin by the post-impact fire, both occupants sustained multiple injuries and burns. This was not considered to be a survivable accident.

1.16 Tests and Research

1.16.1 The aircraft's engine was taken to an approved engine overhaul facility for inspection and stripping. The AMO concluded that no engine related problem could be identified and as such the engine did not contribute to the cause of the accident.

1.16.2 The Garmin 296 GPS that was used by the pilot was recovered and the flight tracks could be downloaded from the unit. Detailed analyses of these tracks were done by SiQ as requested by the investigator, using inter alia their Geographic Information System (GIS) software.

1.16.3 Calculated data:

Some of the data used in the analysis, was not obtained directly from the GPS, but was calculated using the GPS data, or obtained from other sources. Details of these are described below:

Distance between GPS-track points:

The distance between the points on the GPS track was calculated, using the functionality provided by the GIS software.

Speed:

The average speed between two GPS track points was calculated, using the distance calculated by taking the distance between GPS-track points divided by the difference in time between two GPS points (as given by the GPS)- indicated in knots.

Rate of climb/descent:

The average rate of descent/climb was calculated, using the difference in altitude between two GPS points (as given by the GPS) divided by the difference in time between two GPS points (as given by the GPS)- indicated in feet per minute.

Height (above ground):

The altitude of the ground level was established in two ways. Firstly a reading was taken of various points on site by means of a GPS. Secondly a digital elevation model (DEM) was used in the GIS system to determine the ground altitude at various locations. As these did not differ considerably, it was decided to use the DEM altitude as it has more comprehensive coverage. The height above ground was then calculated as the difference in the GPS altitude and the DEM ground altitude at a specific point.

1.16.4 Analysis of track:

General overview:

An overview of the flight is shown in the picture below:

This was the second flight of the particular aircraft and crew for the day. The flight commenced at Howick airfield at 09:32 after a refuelling stop. From the picture it can be seen that the flight only lasted approximately 6 minutes and 50 seconds. The grey background is obtained from the Digital Elevation Model (DEM). Lighter colours indicate lower areas and darker colours indicate higher areas.

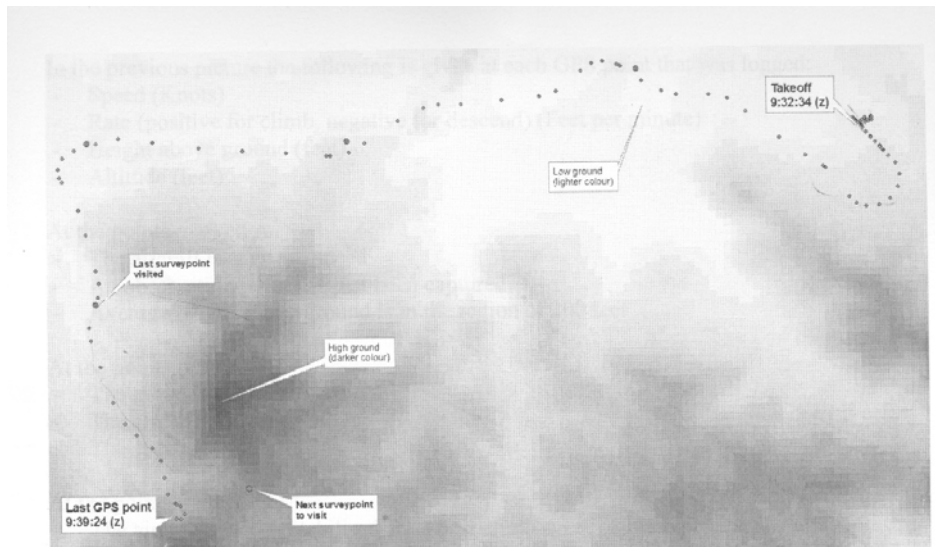


Figure 1: Overview of flight

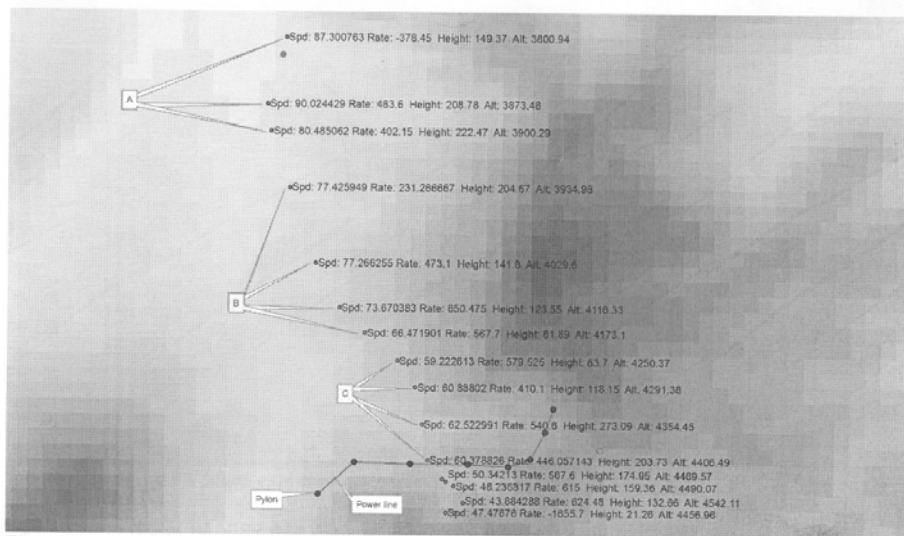


Figure 2: Last point surveyed to next point to be surveyed

In the previous picture (Figure 2) the following is given at each GPS point that was logged:

- Speed (Knots)
- Rate (positive for climb, negative for descent - feet per minute)
- Height above ground (feet)
- Altitude (feet)

At the points marked A- The aircraft is at cruise speed
-An observation point has just been captured
-Average height above ground is in the region of 200 feet

At points marked B- The ground is rising
-The aircraft is also ascending
- The speed is decreasing

At points marked C- The aircraft's speed is stabilised at its best climb speed (60 knots)
-The climb rate is approximately 500 feet per minute (which is normal under the conditions). From the picture it shows that the pilot was following the contour of the earth up the mountain.

1.17 Organisational and Management Information

1.17.1 The aircraft belonged to Spatial Intelligence Pty (Ltd), known also as SiQ Services Pty (Ltd) with its offices based at 53 de Havilland Crescent, Perseus Technopark – Pretoria, which forms part of a group of three companies comprising SiQ Pty (Ltd) and SiQ Investments Pty (Ltd). The operator was operating under Part 95, operating certificate No: G903D, issued on 06 December 2007 and expiring on 06 December 2008.

1.17.2 The aircraft was categorized as a Non Type Certified Aircraft (NTCA) which does not require the issuance of a Certificate of Airworthiness.

1.17.3 The aircraft had been operated commercially and had an Authority to Fly which was issued on 30 January 2007, with an expiry date of 29 November 2008. The last Annual Inspection was carried out on 13 December 2007 at 23.3 airframe hours. The aircraft had accumulated a further 17.7 hours since the last Annual Inspection was certified.

1.17.4 The last Annual Inspection was certified by an Approved Person (AP) (stamp No: 008), who was in possession of a valid accreditation from the Aero Club of South Africa and Micro-light Association of South Africa (MISASA).

1.18 Additional Information

1.18.1 On the day of the accident, the operator's field manager became very concerned as there had been no contact with the pilot or crew and the aircraft (ZU-ETF) was overdue

for landing at Margate Aerodrome. He therefore activated the Emergency Response Plan (ERP) by telephoning SiQ's Safety Officer.

- 1.18.2 As there was no information about the whereabouts of ZU-ETF, he then started phoning the various Air Traffic Control Centres (ATC) around the area, and Durban ATC informed him that an unknown aircraft had gone down near Howick and both occupants were deceased.

1.19 Useful or Effective Investigation Techniques

- 1.19.1 None were used.

2. ANALYSIS

- 2.1 The accident occurred whilst the pilot and a surveyor were on a survey flight from Howick Aerodrome to Margate Aerodrome.
- 2.2 This was the second flight for the day for the aircraft and its crew, which had commenced from Howick Aerodrome after a refuelling stop, and the intended route was to Margate Aerodrome via Underberg and back to Howick Aerodrome as the survey was to include a number of observation points.
- 2.3 The pilot was flying into a valley on a farm where he was following the contour of the earth from low to high ground and as he cleared the power-lines in front of his flight path, he was then caught between two sections of the high terrain with no escape route.
- 2.4 The evidence suggests that the rising terrain was more than the climb-rate capability of the aircraft.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot and a surveyor were on a survey flight in the area of Glencall Farm when the accident happened.
- 3.1.2 The pilot was rated on the aircraft type and his Medical Certificate was also valid at the time of the accident.
- 3.1.3 The pilot was flying low into a valley and was following the contour of the earth from low to high ground, when the accident happened.
- 3.1.4 The pilot was caught between two sections of the high ground after he had just cleared power-lines, with no escape route.
- 3.1.5 The farm owner's daughter witnessed the aircraft flying low over the farm, then it

suddenly pitched up and impacted with the terrain.

- 3.1.6 It appears possible that when flying up the valley, the pilot may have been attempting to increase the climb rate until the aircraft stalled.

3.1 Probable Cause/s

- 3.2.1 The aircraft entered a dead-end valley with rising terrain on both sides, and was unable to clear the rising terrain.

4. SAFETY RECOMMENDATIONS

- 4.1 None.

5. APPENDICES

- 5.1 Not applicable.

-END-

Report reviewed and amended by the Advisory Safety Panel
5 May 2009