CANADIAN FORCES
FLIGHT SAFETY INVESTIGATION REPORT (FSIR)

FINAL REPORT

FILE NUMBER: 1010-Gliders (DFS 2-4-2)
DATE OF REPORT: 1 April 2005

AIRCRAFT TYPE: Schweizer 2-33A Glider, C-FEAF
DATE/TIME: 081615Z July 2003
LOCATION: St Jean Airport, Québec
CATEGORY: "A" Category Accident

SYNOPSIS

The Schweizer 2-33 glider, registration C-FEAF, and crew were participating in the Air Cadet Eastern Region Gliding School at St Jean, Québec. The instructor pilot (IP) and student were on their first launch of the day and their second of the gliding camp. After completing the area work, the IP positioned the glider to join the circuit at approximately the mid point of the downwind leg at 1150' above ground level. Shortly after becoming established on the final approach for Runway One (Rwy-1), the IP and student believed that they felt a downdraft as the glider was observed to be low on approach. Once the IP realized that she could no longer clear the tree line on the approach path, she attempted to complete a 180° left turn in order to conduct an off-field landing in an unobstructed area. During the turn, the glider's left wing contacted the ground, sending the glider cart-wheeling before it finally came to rest in a farmer's field. Both occupants suffered minor injuries.

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1. FACTUAL INFORMATION

1.1 History of the Flight

The glider instructor pilot (IP) and student pilot were participating in the Air Cadet Eastern Region Gliding School (ERGS), St Jean, Québec. This was their first launch of the day and the objective of the flight was to complete Lesson Plan (LP) Two. The LP consisted of the IP demonstrating a number of different manoeuvres and attitudes prior to returning to the circuit for landing.

The launch and area work went as planned before the glider, flown by the IP, joined the circuit at 1150' above ground level (AGL) (all heights are above ground level), at 50 miles per hour (MPH), and approximately mid way along downwind. A second glider, which had joined downwind at 1000' at the upwind point, followed behind the accident glider. Due to congested radio transmissions, neither the IP nor the student made the downwind radio transmission. The accident glider then turned to base at 850', increased airspeed to 60 MPH, and partially opened the spoilers to maintain the appropriate glide path; the IP noted the rate of descent (ROD) at that time to be about 500 feet per minute (FPM). While turning to final at 350', the IP noted the height and airspeed and confirmed the sight picture to the touchdown point on Rwy 1. Shortly after becoming established on final, the glider was observed by ground personnel to be lower on approach than the second glider lining up for Runway Two (Rwy 2), which by this time had caught up to the accident glider. The IP and student then experienced the sensation of hanging in their shoulder harnesses. As this hanging sensation caught her by surprise, the IP closed the spoilers. When the IP realized that she could no longer clear the tree line on the approach path, she attempted to complete a 45° left turn in order to conduct an off-field landing in a clear unobstructed field. The Site Supervisor, who was watching both gliders simultaneously, used a radio to advise the accident glider to initiate a left turn and land in the field before the tree line, though the IP did not recall hearing this advice. The IP realized that the 45° turn still did not provide adequate clearance from the tree line and she therefore opted to continue the turn through a full 180° in an attempt to land in the field behind her. It was approximately at this point that the student in second glider saw the accident glider pass underneath him. The IP believed that the glider had completed most of the turn when, with about 45° of bank or more, the glider's left wing contacted the ground, causing it to snap and the glider to cartwheel. The glider's nose then impacted the ground with sufficient force to snap the tail off at the mid point along the fuselage. The aircraft continued to cartwheel to the left, becoming airborne and completing a 180° turn, before coming to rest. The IP then egressed the glider and assisted the student. A passing ambulance noticed the crash and rendered medical assistance before transporting the IP and student to the local hospital.

1.2 Injuries to Personnel

Both IP and student pilot received minor injuries.

1.3 Damage to Aircraft

The aircraft received “A” category damage (Photo 1). Both wing tips contacted the ground, the left wing broke in two pieces at the inboard end of the aileron, and the underside of the nose cone was pushed inward. The right wing tip fairing received minor damage and buckled at the inboard end of the aileron. The rear fuselage bent at the midpoint (Photo 2).

1.4 Collateral Damage

The accident occurred in a farmer's sowed field. Minimal damage to two fields was caused by vehicle and personnel traffic.

1.5 Personnel Information

Personnel information is tabulated in Table 1. The IP was employed by the Eastern Region Air Cadet Gliding Program and had accumulated 380 flights in the Schweizer 2-33A glider. She had recently completed her IP rating.

Table 1: Personnel Information

	Instructor	Student
Rank	Lt	Cadet
Currency/Category valid	Yes	U/T
Medical Category valid	Yes	Yes
Total Flying Time (Hrs)	61	0.3
Instructional (Hrs)	1	0
Flying hours on type	61	0.3
Flying hours last 30 days	8	0.3
Duty time last 24 hrs	8	8

1.6 Aircraft Information

The aircraft was serviceable prior to the accident. All maintenance and inspections were up to date. The weight and balance was within limits.

1.7 Meteorological Information

The accident occurred at 1615Z. The actual weather conditions for the St Jean airport are not published independently but rather included with St Hubert reports. The forecasts and actuals around the time of the accident at St Hubert were as follows:

TOWER WINDS 290 /10-13 KTS given at approx 1610Z

CYHU 081500Z 25014G19KT 10SM SCT020 SCT099 25.9/21.0 A2976 RMK CU1AC2CI3 SLP076 58012 SKY55=

CYHU 081600Z 25014G19KT 10SM FEW025 SCT097 SCT220 27.2/20.7 A2975 RMK CU1AC2CI0 SLP076 SKY45=

CYHU 081700Z 25016G24 10SM FEW031 FEW100 SCT220 28.5/20.8 A2971 RMK CU3AC2 TCU ASOCTD SLP061 58015 SKY77=

The Terminal Area Forecast was:

CYHU 081127Z 081224 21010 P6SM SCT020 OVC040 TEMPO 1214 BKN020 FM1400Z 24010KT P6SM SCT030 SCST070 TEMPO 1419 BKN030 FM1900Z 23012G22KT 6PSM BKN030 TEMPO 1922 5SM –SHRA BR PROB40 1922 3SM –TRSA BR OVC020CB

RMK FCST BASED ON AUTO OBS AFT 22Z NEXT FCST BY 18Z=

AMD CYHU 081419Z 081424 21010KT 6PSM SCT015 OVC040 TEMPO 1416 BKN015 FM1600Z 24010KT P6SM SCT030 SCT070 TEMPO 1619 BKN030 FM1900 23012G22KT P6SM BKN030 TEMPO 1922 5SM –SHRA BR PROB40 1922 3SM –TSRA BR OVC020CB

Local winds were reported to be 290° at 10 to 13 knots, or 12 to 15 MPH, at the time of accident. All weather conditions were within limits for glider operations.

1.8 Aid to Navigation

Not applicable.

1.9 Communications

Both the glider and Launch Control were equipped with handheld aviation VHF radios to monitor the local tower frequency. Both radios were checked serviceable before launch and remained operational during the glider operations. However, due to congested radio transmissions, neither the IP nor student made the downwind radio transmission.

ERGS personnel initiated emergency response through 911.

1.10 Aerodrome Information

The St Jean Airport is located beside Canadian Forces Base St-Jean (CFB St-Jean). The Air Cadet gliding operation utilizes the grass strips beside Rwy 11/29 while civilian traffic uses the adjacent asphalt Rwys 11/29, 02/20 or 06/24.

An open field is present to the left of and parallel to the final approach path of Rwy 1 (photo 3).

1.11 Flight Recorders

The aircraft was neither equipped with nor required to be equipped with any type of flight recording device.

1.12 Wreckage and Impact Information

The glider was in a medium to steep left turn when, at some point during the turn, the left wing impacted the ground with approximately 45° angle of bank or more. This impact caused the wing to snap at the mid point and the glider to cartwheel. The nose then impacted the ground at a relatively steep angle with sufficient force to snap the tail of the aircraft at the mid point along the fuselage. The aircraft continued to cartwheel, becoming briefly airborne with sufficient energy to complete a 180° turn counter clockwise prior to its final ground impact. The glider came to rest along the final approach path.

1.13 Medical

The IP and student received minor injuries. Toxicological samples were taken from the IP at the local civilian hospital; results were negative. A review of the IP's hospital records was conducted and identified nothing relevant to the Flight Safety Investigation.

1.14 Fire, Explosives Devices, and Munitions

Not applicable.

1.15 Survival Aspects

The forward fuselage area around the cockpit was not deformed and the liveable cockpit space remained unchanged. One pilot's head struck the canopy release handle causing a minor injury. After the accident, the IP egressed the glider and assisted the student in getting out of the cockpit.

1.15.1 Crash Survivability

The crash was survivable. The cockpit maintained its survivable volume and was undamaged. The deceleration forces proved to be within the tolerance level of the human body.

1.15.2 Life Support Equipment

The four-point harness used by the crew was effective and prevented further injury.

1.15.3 Emergency Transmitters

The glider was neither equipped with nor was it required to be equipped with any type of aviation Emergency Locator Transmitter (ELT).

1.16 Test and Research Activities

Nil.

1.17 Organisational and Management Information

All training, administrative and maintenance files were reviewed. With the exception of the IP's training file prior to joining the 2003 ERGS, which was not available, all documents were found to be in order.

1.18 Additional Information

Nil.

1.19 Useful or Effective Investigation Techniques

Nil.

2. ANALYSIS

2.1 The Aircraft

All maintenance documents were found to be correct. The glider's weight and centre of gravity were within limits. The glider was fully serviceable prior to the accident.

Instrument leak and calibration tests were conducted with no leaks found. The air speed indicator (ASI) read two to four MPH (depending on airspeed) slower than actual airspeed. This difference did not influence the outcome of the accident and therefore was considered not to be relevant to this investigation. The altimeter, however, was found to have a static leak. It is reasonable to believe that the leak was due to the shock of the ground impact and was not present immediately prior to the accident. To substantiate this, an account of the accident by the pilot of the second glider was consistent with that of the accident IP's account, including the flown circuit heights. This indicates that the accident glider's altimeter likely functioned correctly.

2.2 The Circuit

2.2.1 The Accident Circuit

The Air Cadet Gliding Manual (ACGM) indicates that the standard circuit is entered upwind at 1000' and is flown at 50 MPH. A turn to base is then completed by 500' after which the airspeed is increased to 50 MPH plus the final approach headwind, to a maximum of 65 MPH. By increasing the approach speed according to headwind, a constant approach groundspeed of 50 MPH is maintained and thus the sight picture also remains relatively constant. Finally, the turn to final must be completed by 300'.

The accident glider entered the circuit high, halfway along the downwind leg, at 1150' AGL. Little height was lost on downwind as the glider turned base at 850'. Through the use of spoilers, a high ROD was then generated, likely in an effort to achieve the recommended final turn height of 300'. The glider rolled out on final approach at about 350'. Shortly thereafter, both the IP and student perceived a sensation of hanging in their shoulder harnesses. Simultaneously, they noted that the glider had dropped below the glide slope and that landing on Rwy 1 was no longer possible.

2.2.2 The Test Flight

A test flight, conducted with a glider configured like the accident glider, was completed to simulate the accident glider's flight path. It was found that while on downwind, an ROD of 400-450 FPM with spoilers closed was needed to make the 850' base turn height. While on base, a 750 FPM ROD with half spoilers was

used to complete the final turn by 350'. This ROD was maintained through the glider's turn to final during the test flight. However, in order to arrive at the final point of impact, the test glider would have required an ROD of approximately 1260 FPM, an increase of about 500 FPM in a very short period of time. Taking into account the radius of turn leading to the point of impact, this ROD can be more accurately refined to about 1000 FPM, an increase of about 250 FPM. This increase of about 250 FPM is discussed below.

2.2.3 Analysis of the Accident Circuit

The accident glider entered the circuit halfway along downwind at 1150', which was significantly higher than normal. Little height was lost on downwind before the glider turned base at 850'. Though higher than normal, a turn to base at 850' was appropriate given the existing strong tailwind of 15 knots. However, the IP then only increased airspeed to 60 MPH rather than 65 MPH as was required by the ACGM. A possible explanation for not increasing to the correct airspeed could rest with the IP, as she may have been distracted while focussing attention on the student. The IP stated that she noticed the ROD along base to be about 500 FPM. Though the use of spoilers was appropriate to increase the ROD, the test flight indicated that in order to fly the accident profile on base and final, an ROD of about 750 FPM was required. Given the strong wind conditions, planning for keeping additional height above the established turn point minimums would have allowed for a lower ROD and would have also allowed for flexibility in achieving a safe landing. The impact of flying the approach higher than normal would have been minimal in that, once the glider had recovered on the ground, a longer than normal push back to the launch point would possibly have been required.

Once established on final at 350' with the spoilers still half open, the pilots experienced a sensation of hanging in their shoulder harnesses. This sensation was consistent with the effects of either a strong localized downdraft or mechanical turbulence caused by the strong low-level winds flowing over the large stand of trees upwind of the glider's position. Although it was not possible to confirm the presence of a downdraft or mechanical turbulence- the second glider flying closely behind the accident glider felt no such effects – significant downdrafts were unlikely due to the ambient weather conditions. Conditions reported by gliding personnel indicated an overcast layer without the presence of strong convective activity. Some mechanical turbulence from the trees may have been present and significant enough to cause possible ROD variations of the magnitude of 250 FPM. Being higher and on the correct glide path, the second glider likely did not encounter any mechanical turbulence; by the time it was low enough to experience any turbulence, the glider was either above or upwind of the stand of trees and therefore clear of its location. Finally, when the accident pilots experienced their downward sensation, it was possible that the spoilers were inadvertently manipulated, further increasing an already high ROD.

With a final approach airspeed of 60 MPH, the glider's groundspeed reduced to 45 MPH. Had the airspeed been increased to 65 MPH as per direction within the ACGM, which was most appropriate for the 15 knot headwind, a 50 MPH groundspeed would have resulted. This is significant for two reasons. First, given a constant ROD, the forward distance that the glider would have travelled at the 45 MPH groundspeed would have been less than the distance it would have travelled at a 50 MPH groundspeed. Without increasing the airspeed to 65 MPH, the glider would likely have experienced difficulty in reaching the landing area. Second, because the groundspeed was slower than normal, the pilots' sight picture would have differed from what they expected to see.

The IP stated that she was surprised by a higher than normal ROD, this was possibly due to a combination of mechanical turbulence and, because of her focussed attention on the student, distraction from accurately flying the approach. Most probably the IP was also surprised by an unexpected sight picture as her landing area aim point travelled up the windscreen as the result of a lower than normal groundspeed, which was due to an airspeed too slow for the strong wind conditions. The IP's surprise likely delayed her recognition of a rapidly and increasingly height-critical situation such that the decision to turn away from the tree line on final was made too late to affect a safe turn and landing.

As a result of being below glide slope and the trees creating an unavoidable obstacle on the final approach path, the IP decided to perform a left turn to a clear area behind her.

2.3 The IP's Reaction to the Low Flight Profile

The IP stated that she was surprised by the downward sensation that she encountered on final approach. In a time and height constrained situation, the IP chose to conduct a low-level steep turn to a clear area. Initially her intent was to land in a field to her left but when this proved to be unsatisfactory she decided to complete a full 180° turn to a field behind her. Although the Site Supervisor advised the IP to initiate a left turn, the IP stated that she did not hear this advice, likely due to her focussed attention on the situation. A review of the situation by the Investigation Team indicated that a safe off-field landing could have been affected using a more suitable lower angle of bank left turn by 45°-90° (Photo 3). This would have perhaps meant accepting the risk of some interference from the thin line of scrub or tree in this area over the risk of continuing such a low level turn.

Low-level turns are considered dangerous due to the glider's large wingspan and the high possibility of the wing striking the ground. In this case, the turn appeared to be a quickly thought of (reactive) response to a low-level situation that could have been safely handled after anticipation of the deteriorating situation and consideration of the field area 45°-135° left of the approach path.

It was also the impression of the Investigation Team that the IP might not have had a complete understanding of not only the hazards of low-level turns, but also the actions and preparations to be taken in the event of an off-field landing. These actions would include such aspects as the early recognition of a developing height-critical situation, early determination of the requirement to commit to an off-field landing, maintaining wings level, not allowing airspeed to decay, making only gently banked turns in close proximity to the ground, and possibly even accepting obstacles in the flight path over low-level turns. The ACGM states that a glider must be established on final approach by 300'. Similarly, a corresponding statement identifying the minimum height at which wings level must be achieved during an off-field landing would assist in the low-level decision-making process.

The 2003 and 2004 Annual DFS Air Cadet Briefings highlighted several recent accidents (C-FEAF in 2000, C-GCLY in 2001, C-GCLN in 2002, and C-FEAF, C-GCSD, and C-FYLP in 2003) which all involved manoeuvring at low height in preparation for an off-field landing. These accidents indicated that insufficient emphasis during training has been placed on preparing both students and junior instructors for the proper set-up and conduct of off-field landings. These accidents also show that low-level turns and a willingness to stretch a glide only result in increased risk of injury to aircrew and damage to aircraft. No warnings exist within the ACGM to highlight these hazards.

2.4 The IP's Experience

The IP received her instructor pilot license on 26 June 2003 and had 36 flights from the back seat position prior to this accident. She received her instructional qualification after completing the ERGS instructor training; no pilot decision making training has been mandated within the ACGP. Although she had accumulated 376 flights in the glider and had been qualified to carry passengers for several years, she was inexperienced in performing instructional duties and had accumulated only 1.0 hours of instructional flight time prior to the accident. The IP's motivation to carry out her instructional duties to the best of her ability was obvious. However, with only one hour of instructional experience, it was possible that the IP channelized her attention on the student to the detriment of accurately flying the circuit (60 MPH versus 65 MPH) and assessing the flight profile in light of the strong winds (late recognition of high ROD and descent below glide path).

With respect to preparing for the imminent off-field landing, the procedures that the IP had been previously taught for take-off emergencies generally involved a 180° return to a landing area. The IP was comfortable with this practiced manoeuvre and, during the accident flight, also elected to do a 180° turn to an area she knew to be clear. Under these circumstances, low height and the use of a steeply banked turn resulted in the left wing tip contacting the ground and the aircraft cart wheeling to a halt.

It is worthy to note that the IP had recently been involved in the annual crash response exercise in which she was placed in a position, by a check pilot, that required her to conduct an off-field landing to exactly the same field used in the accident. Furthermore, during her recent instructor training, the IP was told by an instructor "to conduct a 180° turn [when the flight path went below the trees] and to go land in the same field." Although this may have been effective advice for a height-critical situation that was determined early enough and while the glider still had sufficient height to safely complete a 180° turn, this advice could clearly not be successfully applied to all situations. It was concluded that, although the circumstances during the exercise were controlled and pre-planned, this off-field exercise, coupled with previous training, pre-disposed her, when faced with a height-critical situation, to conduct a 180° turn rather than assess other available options.

2.5 Result of Analysis

The Flight Safety Investigation Team concluded that this accident was the result of the following sequences of events:

a. The initial circuit set-up was poorly co-ordinated and resulted in a slower than required airspeed and a higher than required ROD along the base and final legs of the circuit;

b. Once on final approach, the glider continued its descent below the normal glide slope while maintaining a ROD almost twice that of normal;

c. After likely encountering some mechanical turbulence, the high ROD increased further, catching the IP off guard;

d. The IP was slow to recognize the development of a height-critical situation from which the normal landing area could not be reached;

e. Throughout the circuit and until she identified the height-critical situation, the IP's attention was likely focussed on the student rather than accurately flying the circuit profile in the challenging wind conditions;

f. The IP's reaction to the height-critical situation was to conduct a 45° turn to the left. Continued obstruction to the flight path prompted the IP to continue the turn through 180° while at very low level and using 45° of bank or more;

g. Based on previous training, the IP was likely predisposed to attempt a landing in the field in which the glider finally came to rest;

h. During the low-level turn, the wing tip hit the ground and resulted in "A" category damage; and

i. There is insufficient guidance within the ACGM on the preparation for and conduct of off-field landings.

3. CONCLUSIONS

3.1 Findings

3.1.1 The pilots, aircraft, and weather conditions were all suitable for the mission.

3.1.2 The IP entered the circuit higher than normal at the mid-point on downwind and, while on base, subsequently used spoilers to increase the glider's ROD in an effort to correct to the standard circuit profile.

3.1.3 While on base and final, the glider probably maintained a ROD of up to 750 FPM that was almost twice the normal ROD.

3.1.4 While on base and final, the glider maintained 60 MPH. Given the wind conditions, (a 15 MPH headwind on final approach), the glider should have maintained 65 MPH.

3.1.5 This relatively slow airspeed (60 MPH) exacerbated the glider's height-critical situation and made it more difficult to reach the designated landing area.

3.1.6 Once on final, the IP and student were surprised by a sensation of hanging in their shoulder harnesses and a rapid increase of ROD to an estimated 1000 FPM.

3.1.7 The probable existence of mechanical turbulence from a large upwind stand of trees likely contributed to the increased ROD that the pilots experienced on final.

3.1.8 Once the glider dropped below the desired glide path, the IP realized that a large stand of trees on the approach path precluded her from landing straight ahead; she then closed the spoilers.

3.1.9 Throughout the circuit and until she identified the height-critical situation, the junior IP had likely focussed her attention on the student to the detriment of accurately flying the circuit.

3.1.10 In a time and height constrained situation, the IP chose to land in a clear field behind the glider and subsequently decided to conduct a low-level 180° left turn using 45° of bank or more.

3.1.11 The low-level turn resulted in the glider's wing striking the ground and causing "A" category damage.

3.1.12 There were other acceptable areas that required only gentle manoeuvring to prepare for and conduct an off-field landing.

3.1.13 Prior to the accident, the IP had participated in a training exercise in which a glider conducted an off-field landing to the same field as the crash site. Coupled with previous training and this recent off-field exercise, the IP may have been pre-disposed, when faced with a height-critical situation, to conduct a 180° turn rather than to assess other available landing options.

3.1.14 The IP had an incomplete understanding of not only the hazard of low-level turns, but also the actions and preparations to be taken in the event of an off-field landing.

3.1.15 Since 2000, six glider accidents involved manoeuvring at low height in preparation for an off-field landing. These accidents indicate that insufficient emphasis within the ACGM and during training has been placed on preparing both students and instructors for the proper set-up and conduct of off-field landings.

3.1.16 No warnings with respect to the hazards of conducting low-level turns or stretching a glide exist within the ACGM.

3.1.17 There is no pilot decision making training provided to pilots within the ACGP.

3.2 Cause

The IP conducted a low-level turn and allowed the left wing to contact the ground, sending the glider cart wheeling along the ground.

3.3 Contributing Factors

3.3.1 The inexperienced IP had likely focussed her attention on the student to the detriment of accurately flying the circuit.

3.3.2 The IP's circuit mis-management with respect to airspeed and continued use of spoilers put the glider below the final approach glide path.

3.3.3 The IP demonstrated incomplete knowledge of the hazards of low-level turns in addition to the actions and preparations to be taken in the event of an off-field landing.

3.3.4 The IP may have been pre-disposed to conduct a low-level 180° turn.

3.3.5 A poor awareness of both off-field landing procedures and the hazards of low-level turns exists within the Air Cadet Gliding Program.

4. SAFETY MEASURES

4.1 Safety Measures Taken

4.1.1 Circuit pattern, site picture, and alternatives to low-level 180° turns were discussed with ERGS personnel.

4.1.2 The 2003 gliding season bore witness to a significant increase in the ACGP's accident rate. As a result, DFS attended the Annual Air Cadet Flying Training Conference, in October 2003, with the aim of identifying general deficiencies within the gliding system and determining possible solutions. In DFS 1010-1, DFS Report for the VCDS: Air Cadet Gliding Program, 13 Nov 03, several recommendations were identified. The primary ones are as follows:

a. A Glider Standards Evaluation Team should be established. This recommendation was completed in Sep 04;

b. Central Flying School (CFS) should facilitate the development of a standard Glider Instructor Refresher Course in conjunction with the RGS. This was completed in Jun 04;

c. Consideration should be given to incorporating the CFS Flight Instructor Course into glider instructor training. This was completed in Jun 04; and

d. The Regional Cadet Air Operations Officers should be considered for appointment as Commanding Officers for the entire year. The 2004 Flying Training Conference Record of Decision indicated that this issue would be resolved by a change in the chain of command structure and not by appointment as a fulltime CO.

4.2 Further Safety Measures Required

4.2.1 Increased emphasis on off-field landing procedures must be included within the ACGP ground school. This should include identifying the hazards of and alternatives to the low-level turn.

4.2.2 The ACGM must provide improved guidance for off-field landing procedures and warnings on the hazards of turns in close proximity to the ground.

4.2.3 Pilot decision making training should be incorporated into the ACGP.

4.3 Other Flight Safety Concerns

One recommendation from the 2003 Annual Air Cadet Flying Training Conference, that methods should be found to reduce the training tempo at the RGS, remains outstanding.

4.4 DFS Comments

This accident involved an inexperienced instructor who, for a variety of reasons, found herself in a height critical situation that necessitated an off field landing. It appears that this instructor did not have the training or knowledge to help her make appropriate decisions in this critical regime of flight. Given that six glider accidents since 2000 have involved low-level turns, it appears that this shortcoming was not unique to this IP or to this Gliding Region. The Air Cadet Glider Program therefore needs to re-emphasize to its instructors and students not only the significant hazards involved with conducting a low-level turn, but also the multiple options available to a pilot to deal with a potentially height-critical situation before it becomes unsafe.

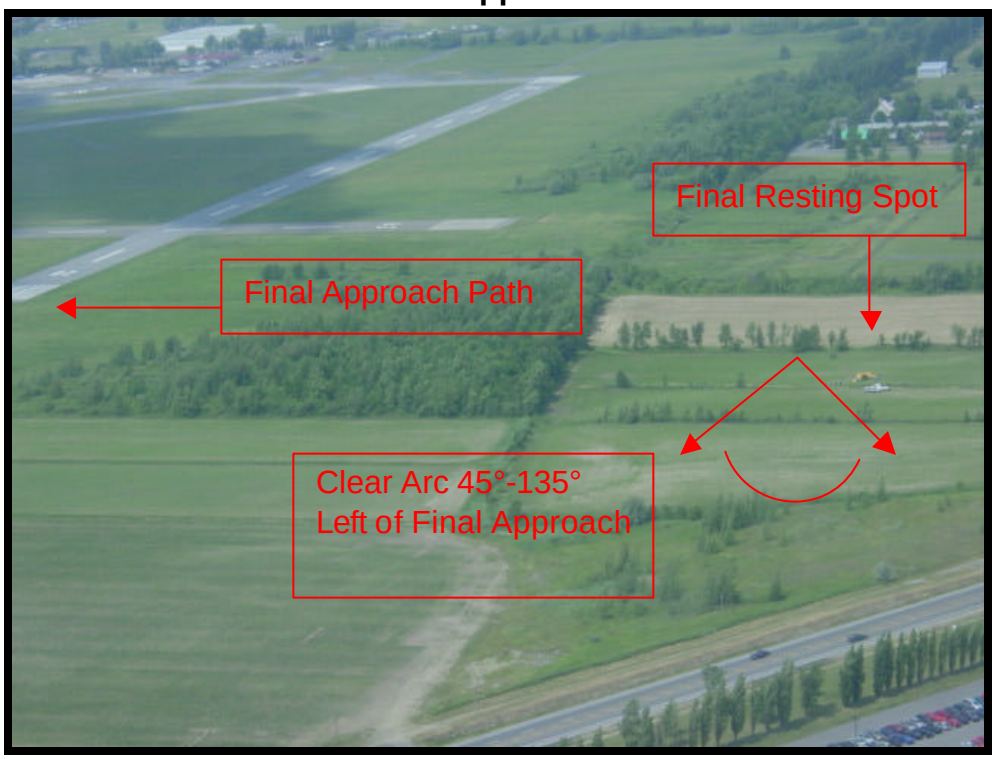
A.D. Hunter
Colonel
Director of Flight Safety

ANNEX A: PHOTOGRAPHS

Photo 1: Final Resting Place

Photo 2: Left Wing Damage

Photo 3: Clear Area to Left of Approach



ANNEX B: ABBREVIATIONS

ACGM	Air Cadet Gliding Manual
ACGP	Air Cadet Gliding Program
AGL	Above Ground Level
AIA	Airworthiness Investigative Authority
ASI	Air Speed Indicator
CFB	Canadian Forces Base
CFS	Central Flying School
DFS	Director (ate) of Flight Safety
ELT	Emergency Locator Transmitter
ERGS	Eastern Region Gliding School
FPM	Feet Per Minute
IP	Instructor Pilot
LP	Lesson Plan
MPH	Miles Per Hour
RGS	Region Gliding School
ROD	Rate of Descent
RWY	Runway
U/T	Under Training
VCDS	Vice Chief of Defence Staff