

**CAA Safety Investigation Report
Loss of Control During Approach to Land
PZL-Swidnik PW-5 ZK-GPE
Tauranga Aerodrome
01 May 2016**



Sample image PZL-Swidnik PW-5 glider (Source JetPhotos.net)

Executive summary

The Civil Aviation Authority (CAA) was notified on 01 May 2016 by the Rescue Coordination Centre New Zealand, that ZK-GPE a PZL-Swidnik PW-5 glider, had crashed on Tauranga Aerodrome and that the pilot had received life threatening injuries. The Transport Accident Investigation Commission was in turn notified and chose not to investigate. A CAA safety investigation was commenced the following day.

The student glider pilot was conducting a first solo flight on type in the single seat PW-5 glider. Observers witnessed the glider over fly the intended runway for landing, commence a left turn and descend at a high rate striking the ground. The student pilot initially survived the accident but passed away the following day from injuries received in the accident.

The CAA safety investigation found that the accident occurred as a result of the pilot losing control of the glider during a steep left turn after a discontinued landing approach to the intended runway. Due to the low altitude when the loss of control occurred, the pilot was unable to effect a recovery before the glider struck the ground.

The CAA safety investigation identified that the student pilot had minimal solo flight experience prior to the first flight in the single seat PW-5 glider. A lack of guidance material available in the Gliding New Zealand Instructor's Training Manual with regards to single seat glider conversion was also identified as an issue. CAA Safety Recommendation 17A1007 was raised with Gliding New Zealand for amendment to the training manual to incorporate guidance material. The recommendation was accepted and has been completed.

What happened

On 01 May 2016 at approximately 1445 hours New Zealand Standard Time, a student glider pilot was completing a first solo on type flight in ZK-GPE, a PZL-Swidnik PW-5 at Tauranga Aerodrome. Following an aero-tow to two thousand feet and after an approximate flight time of 10 minutes, the student pilot advised Air Traffic Control (ATC) that ZK-GPE was returning to land at the aerodrome. Witnesses on the ground observed the glider on final approach to grass Runway 04, the glider appeared to be higher than would normally be expected.

The glider was observed to over fly the runway at approximately 200 feet without losing appreciable altitude. Nearing the upwind end of the runway, the glider was seen to roll to the left and commence a left turn. The glider continued to roll to the left and then descend in a steep nose down attitude with a high rate of descent before striking the ground and two parked glider trailers.

First responders, fire and emergency personnel attending the scene provided immediate first aid to the student pilot who was then taken to hospital. The student pilot later succumbed to severe head injuries received in the accident.

The location of the accident was the grass environs of Runway 04/22 adjacent to the Tauranga Gliding Club, S37° 40' 05.08" E176° 11' 37.51" elevation 10 feet above mean sea level.

The facts

The purpose of the flight was for the student glider pilot to gain solo flight experience on the gliding club's single seat PW-5 glider, while training towards achieving the Qualified Glider Pilot Certificate. The student pilot's previous dual and solo gliding experience had been carried out utilising the gliding club's PZL Puchacz two seat gliders.

The student pilot had minimal solo flight experience gained in the two seat training gliders prior to the flight in the single seat PW-5 glider. The student pilot had also flown with a number of instructors (nine) during previous training flights.

On the day of the accident, a dual flight was carried out prior to the student pilot being sent solo in the PW-5 glider. This flight was of 15 minutes duration and completed approximately 30 minutes prior to the accident flight. The main purpose for this flight, according to the gliding instructor, was to check that the student pilot was proficient in using the radio to communicate with ATC. The gliding instructor noted that during the flight the student pilot did not have any issues with flying the glider and that the student pilot's behaviour was 'very normal'. The gliding instructor commented "I was satisfied that the pilot's ability to land the glider was adequate". The gliding instructor also observed the student pilot's take-off in the PW-5 glider which was by aero-tow, his recollection is that the student pilot seemed to have good control of the glider.

The glider was towed up to an altitude of two thousand feet and then released. Approximately 10 minutes later the student pilot called ATC and advised 'Golf Papa Echo joining shortly'. ATC acknowledged this and cleared the student pilot to join downwind for grass Runway 04. Approximately two minutes later the glider pilot called ATC advising that 'Golf Papa Echo was downwind grass 04'. ATC then advised that ZK-GPE was cleared to land at the student pilot's discretion.

A number of witnesses on the ground who also included the gliding instructor and ATC personnel, observed the glider approach the runway and the ensuing accident. All commented that the initial approach to the runway was high. The gliding instructor noted that the student pilot had extended the airbrake but it was then retracted. The glider was observed to over fly the length of the runway at approximately 150 to 200 feet above ground level without losing any appreciable altitude.

A radio call was heard and recorded by ATC from the pilot of ZK-GPE advising 'Downwind grass 22'. Grass Runway 22 is the reciprocal grass Runway to 04. Shortly after this radio call was made, ATC personnel in the Control Tower observed the glider bank sharply to the left and enter what was thought to be the entry to a spin to the left. A further, very brief radio transmission was recorded by ATC approximately 10 seconds after the student pilot's 'Downwind grass 22' radio call. There were no words spoken in this brief transmission and it is thought quite likely that this transmission was made by the student pilot having pushed the radio Push to Talk Switch in the moments when control of the glider was lost.

Witness marks and damage to the glider and glider trailers at the accident site, indicate that the glider was in a nose low, left wing down attitude with rotation to the left when it struck the ground.

Although the student pilot was adequately restrained in the glider, he suffered serious head injuries during the accident sequence when the glider struck the parked glider trailers.

Pilot information

The student pilot had commenced his training in June 2015 and had completed a first solo flight in March 2016 after 16 hours 12 minutes of dual flight time. At the time of the accident the student pilot was nearing the completion of the training required for the gliding A Certificate. During the course of the training, the student pilot had completed three previous solo flights in the Puchacz two seat glider. The last two solo flights were carried out 11 days prior to the accident flight. At the time of the accident, the student pilot had accrued a total of 49 minutes of solo flight time attained during three flights and a grand total of 19 hours six minutes flight time attained during 40 flights as recorded in the student pilot's gliding log book.

It was reported by the gliding instructor that on the day of the accident the student pilot appeared to be 'his normal self'. Autopsy results did not reveal any alcohol or drugs which might have affected the student pilot's performance on the day of the accident.

Weather conditions

The weather conditions at the time of the accident were described by the gliding instructor as "near perfect for the intended flight". The METAR (Meteorological Aviation Report) for Tauranga Aerodrome recorded a light north-easterly breeze of four knots, 27 kilometres visibility, no cloud and a temperature of 19 degrees Celsius. Based on the recorded weather information and that reported by the gliding instructor, weather was not considered to be a factor in this accident.

Aircraft information

ZK-GPE, a PZL-Swidnik PW-5 single seat glider, was imported new into New Zealand from Poland in 1994 and subsequently issued with a Standard Category Certificate of Airworthiness by the CAA.

At the time of the accident, the glider had accrued 1501 hours flight time and 1989 launches as recorded in the Aircraft Log Book.

The most recent maintenance carried out on the glider was an Annual Review of Airworthiness, and 24 month avionics and instrument checks carried out on 26 April 2016. There were no reported defects which might have affected the glider's serviceability.

As far as could be determined, inspection of the glider during the safety investigation failed to find any defects which might have affected the pilot's ability to control the glider in flight.

Wreckage and impact information

The glider struck the ground in a steep nose low and left wing down attitude while rotating to the left. The glider also struck two glider trailers which were parked at the end of the gliding club hangar.

Witness marks on one of the glider trailers and the glider itself, indicate that the cockpit area of the glider came into contact with the chassis of one of the glider trailers which caused major disruption to the right side of the glider's cockpit.



Figure 1: Accident site (CAA photo)

Analysis

The CAA safety investigation determined that after over flying the runway, the student pilot had attempted to turn 180 degrees with the intention to land on the opposite runway. During this turn the glider stalled and entered a spin to the left from which there was insufficient height to effect a recovery.

During the approach to land on Runway 04, the student pilot had extended the airbrakes initially to descend, however, as the gliding instructor observed, these were retracted and the student pilot then opted to attempt a landing on the reciprocal runway. Although the safety investigation could not positively determine the reason why the student pilot took this course of action due to a lack of evidence, the following two scenarios are considered likely:

- Being unfamiliar with the PW-5 glider's performance, the student pilot was unsure as to whether a suitable rate of descent could be achieved to enable a landing on Runway 04.
- The pilot may have become cognitively overloaded due to a lack of experience and aborted the approach to Runway 04 electing to attempt an approach to Runway 22.

It is evident by the student pilot's radio call 'Downwind grass 22' that he had the intention of completing a 180 degree turn at low level in an attempt to land on the reciprocal runway. Due to the position of the glider in relation to the runway, this manoeuvre would have required a steep turn to achieve this. However, during this turn the student pilot has lost control of the glider.

Analysis of the student pilot's log book and flight training records revealed that the majority of the student pilot's flying training had been carried out in the gliding club's PZL Puchacz two seat gliders. After approximately 16 hours and 10 minutes of dual instruction attained over 37 flights, the pilot completed his first solo flight on 30 March 2016. This was then followed by two dual flights on 13 April 2016 totalling 24 minutes.

On 20 April 2016, the student pilot completed a further dual flight of 30 minutes duration followed by two solo flights of 20 minutes duration each which then completed the requirements for the pilot's A Certificate to be issued. Prior to his first flight in the PW-5 single seat glider, the student pilot had accrued 49 minutes of solo flight time accumulated over three flights in the PZL Puchacz glider.

During the training towards his A Certificate, the student pilot had flown with a number of gliding instructors. Although not ideal in terms of training continuity, the student pilot made satisfactory progress through the A Certificate training syllabus. A review of the student pilot's log book and training records revealed that the gliding instructor who was checking the pilot out for his first flight in the PW-5 glider had spent little dual instructional time with him. Although the instructor had many years of gliding experience, given little instructional time spent with the student pilot, it is unlikely that the gliding instructor was fully cognisant of the student's performance and ability.

Following the accident, the gliding club involved has implemented a peer review process with a panel of gliding instructors who have been involved with the student pilot's training. The purpose of the peer review is to discuss and evaluate a student's suitability for progression onto a single seat glider.

During the safety investigation, a number of gliding clubs in New Zealand were surveyed with regard to solo flight experience before pilots transitioned onto a single seat glider. It was found that the average flight experience requirements prior to advancing to a single seat glider was 10 solo flights and approximately two to three hours solo flight time. The solo flight time was required for the glider pilot to consolidate their skills and gain further solo experience prior to moving onto a single seat glider. Based on the information gained during the survey, it is likely that the student pilot was insufficiently experienced for his first flight in the single seat PW-5 glider.

Gliding clubs typically follow the training syllabus and recommendations contained in the Gliding New Zealand Instructor's Training Manual. At the time of the accident, little training

information was available to the clubs. Gliding New Zealand has since amended the training manual to incorporate a section 'Conversion to single seater and type conversion'. Contained in this amendment is the recommendation that: 'As a general rule of thumb, 10 to 15 solo flights and around 1.5 to 2 hours solo time would not be unusual for someone that has only flown a limited number of 2 seat glider types'. Refer to Annex A for further information.

Conclusions

During a steep reversal turn after over flying the runway in use, the glider has stalled and entered a spin from which there was insufficient height for the student pilot to effect a recovery.

Prior to the accident flight, the student pilot completed a dual check flight during which the gliding instructor assessed the pilot as being competent to go solo in the PW-5 glider.

The gliding instructor had not flown regularly with the student pilot.

The student pilot was unfamiliar with the handling characteristics and performance of the PW-5 glider.

The initial take-off under aero-tow was observed by the gliding instructor who thought that the student pilot was handling the glider well.

During the approach to land, observers on the ground noted that the glider was high on the final approach, but in their opinion and experience, he could have still completed a landing on the runway.

On the final approach the airbrakes were seen to be extended and then observed to be retracted.

It is possible that the student pilot felt that the airbrakes on the PW-5 glider were not effective enough to provide the required descent profile to enable a landing on Runway 04, or for some other unknown reason he changed his plan, instead opting to land on the opposite vector.

Without the use of the airbrakes, the glider lost minimal altitude and over flew the runway at approximately 200 feet.

The student pilot made a radio call stating that he was now downwind for Runway 22, confirming his intention was now to land in the opposite direction.

The student pilot's solo flight time of 49 minutes and 3 flights prior to his first flight in the PW-5 glider was probably inadequate.

Information contained in the Gliding New Zealand Instructor's Training Manual did not adequately cover pilot conversion onto single seat glider types.

The student pilot initially survived the accident but passed away the following day.

Safety Actions

Following the accident, the gliding club involved has introduced a peer review process with a panel of gliding instructors to evaluate a student's suitability for progression onto a single seat glider.

CAA Safety Recommendation 17A1007 was raised on Gliding New Zealand to amend the Gliding New Zealand Instructor's Manual with additional information to provide guidance with regards to conversion onto single seat gliders.

This recommendation has been accepted and completed. Annex A to this report contains the additional information incorporated into the training manual.

Safety Message

The transition for glider pilots from twin seat to single seat gliders is based primarily on demonstrated skill and attitude rather than a set number of hours or flights. Normally, just after solo, a pilot has neither the ability nor the experience to move on to more advanced training sequences or flights. A number of solo flights should be made to consolidate what the trainee has recently learned.

Gliding instructors who mentor a student glider pilot should ensure that the student pilot is capable of handling the transition to a single seat glider and all training requirements have been met. A detailed briefing on the different handling characteristics of the new glider type to be flown is an essential element of the single seat rating.

A gliding club's standard operating procedures should provide guidance to both students and instructors for transition onto a single seat glider. The Gliding New Zealand Instructor's Handbook provides guidance with regards to the recommended training to be carried out.

About the CAA

New Zealand's legislative mandate to investigate an accident or incident are prescribed in the Transport Accident Investigation Commission Act 1990 (the TAIC Act) and Civil Aviation Act 1990 (the CAA Act).

Following notification of an accident or incident, TAIC may conduct an investigation. CAA may also investigate subject to Section 72B(2)(d) of the CAA Act which prescribes the following:

72B Functions of Authority

(2) The Authority has the following functions:

- (d) To investigate and review civil aviation accidents and incidents in its capacity as the responsible safety and security authority, subject to the limitations set out in section [14\(3\)](#) of the [Transport Accident Investigation Commission Act 1990](#)

The purpose of a CAA safety investigation is to determine the circumstances and identify contributory factors of an accident or incident with the purpose of minimising or reducing the risk to an acceptable level of a similar occurrence arising in the future. The safety investigation does not seek to ascribe responsibility to any person but to establish the contributory factors of the accident or incident based on the balance of probability.

A CAA safety investigation seeks to provide the Director of the CAA with the information required to assess which, if any, risk-based regulatory intervention tools may be required to attain CAA safety objectives.

Civil Aviation Authority of New Zealand
Level 15, Asteron Centre
55 Featherston Street
Wellington 6011
OR
PO Box 3555, Wellington 6140
NEW ZEALAND

Tel: +64-4-560 9400 Fax: +64-4-569 2024
www.caa.govt.nz

Annex A: Gliding New Zealand Instructor's Manual amendment content

Conversion to Single Seater and Type Conversion

Converting pilots to fly a single seat glider for the first time or to a higher performing glider is not something that should be treated lightly. It is a significant step that requires an instructor's first-hand knowledge of the pilots flying skills, temperament and ability to cope with the different handling characteristics of something very new to the student.

All students/pilots are different and therefore it is imprudent to impose set minimums for a first conversion to a single seater. A pilot that has a background in flying multiple different powered aircraft will be very different to a student who has only ever flown one type of dual glider. Also the first type of single being converted to, is a factor and ideally it should have handling characteristics that are consistent with training aircraft. As a general rule of thumb, 10 to 15 solo flights and around 1½ - 2hrs solo time would not be unusual for someone that has only flown a limited number of 2 seat glider types.

If the club has high performance single seat gliders, then they should establish through their SOP minimum qualifying criteria for club pilots to fly.

Flight Manual

The first step to any conversion is for the pilot to read the flight manual. If the club has any briefing notes relating to the glider, these also must be read.

Briefing

A thorough briefing on the type must be given. The only exception would be for an experienced QGP for whom there is no other person in the club familiar with the type. Even in this situation, every endeavour to obtain a type briefing from a more experienced pilot or instructor should be made. Particular attention should be paid to the pre-flight inspection, type handling, weight and balance, location and operation of all controls, normal operating speeds, the placard speeds and general handling characteristics in the air and on the ground. Concentrate particularly on the differences from previous types flown.

Time must be given to let the pilot sit in the glider for a period of time before lining the glider up for launch. This not only gives time to ensure that the seating position is comfortable, but also to try out the controls and become familiar with the layout and instrument positions.

Ballast

It is a good idea to ensure that all early flights are ballasted with a Centre of Gravity set reasonably well forward. This may give more benign stall characteristics.

Airbrakes

Airbrake performance is unique to the type of glider being flown. Some will stay out when deployed and are very powerful. Others are light, less powerful and have tension to want to close or open. Different gliders may require a change of pitch to maintain a constant speed and others not. Some have air buffet and increased sound when deployed and others will be very smooth and quiet.

Briefings on airbrakes should also include the wheel brake, which on some gliders is on the end of the airbrake. The over centre closing lock can differ on all gliders, so should be tried and tested on the ground. Discussion on the performance of airbrakes is an essential part of any conversion.

Flaps

Ideally training should be given on the use of flaps in a 2 seater first, but if this is not available, then a full briefing on their use must be given with full reference to the flight manual. Familiarity of which lever is flap and which is airbrake is to be emphasised. Use and effect of flaps will be different for each glider, during launch, cruising and landing, so briefing on each of these should be given.

Aerotow

If pilots are converting to a single that has a belly hook only, emphasis should be made of what to do in the event of an aerotow upset or PIO's (pilot induced oscillations). The pilot must be prepared to release immediately in an emergency situation and be able to deal with the circumstances they then find themselves in.

The first several flights in a new type should be done in ideal conditions and it would be prudent to restrict to local flying. As the glider becomes more familiar, the pilot will be able to handle more difficult conditions and better able to cope with emergencies. The rate of progress will be different for each pilot depending on their previous experience and skills.