

FATAL ACCIDENT REPORT  
Bernie Zwahlen  
Hughenden, QLD  
11-09-05



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Hang Gliding Federation Australia

Date: April 2007  
Re written following PC crash Jan 07

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*The fundamental objective of the accident reporting and investigation process is to establish a means by which to prevent future accidents and incidents. The investigation aims to determine the primary and secondary causes and any contributing factors related to the accident. It is not intended in anyway to allocate fault or blame.*

*The information gained from the investigation is to be used as the basis for enhancing the ongoing level of safety in our sporting activities through the initiation of actions to*

- . promote awareness of accident causes,*
- . reduce hazards; and*
- . revise standards where required.*

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### Witness Reports

Primary Witness Interviews were conducted with the following:

Ian Graham – Safety Officer Cairns HG Club, observer in car at time of incident

Nevile Akers – tow driver

Russel Krautz – witness

Wayne Rankin – witness

Terry Way – witness

James Simpson - witness

Other interviewees:

Alan Daniels – WingTech releases

Bill Moyes – Arguably the worlds most experienced tow operator having started  
the sport of hang gliding using towing operations since 1965

Rohan Holtkamp – Highly experienced HG instructor training in tow operations

Inspection of the accident site was undertaken by Chris Fogg, General Manager  
HGFA with Sgt Ian Thomson providing details of onsite locations.

### Crime Scene Investigator Report

Snr Const Tim Maker

Sgt Ian Thomson – Hughenden Police Stn

### Aircraft Inspection Report:

The aircraft (hang glider) was viewed by Chris Fogg and Ian Graham together with Ian Thomson as the Hughenden Police Station. Aircraft Inspection Report has been provided by Ian Graham. Mr Graham was familiar with the pilot and aircraft configuration through many club activites where the deceased participated in towing and hill launch operations.

### Pilot Details:

*Name:* Bernard Zwahlen

*Address:*

749 Seamark Rd

Malanda, Qld 4885

**Next of Kin:** Monika – Wife & two daughters

***HGFA Join Date:*** 11/08/1996

***Hours in Aircraft Type:*** 735+

***Hours last 90 days prior to accident:*** 60+

***Total Pilot Hours (includes other aircraft types):*** 735+

*Hours flown are recorded by the HGFA as part of the administration during annual membership renewal.*

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### Accident Time:

Accident occurred at approximately 5 pm on 11 September 2005  
Initial report was made to HGFA at 6:30 pm by Ian Graham

### Accident Location:

Hughenden Airfield (YHUG) 1043 ft AMSL

### HGFA Membership:

*Member Number:* 45610

*HGFA Membership Status:* Current Financial

*Experience/ Qualification:*

HG-Advanced Pilot Certificate issued 2001

HG-Ground Tow Endorsement issued 1998

HG-Aero Tow Endorsement issued 1998

*Endorsements were issued when intermediate pilot certificate was held.*

### Weather at time of accident:

*Wind:* 5 – 9 knts Southwestly gusting to 13 knts

*Sky/ Visibility:* Overcast 7/8 part cloudcover

*Temperature:* 25 Degrees C

### Aircraft Details:

*Make:* Airborne

*Model:* C2

*Hours of Operation:* Unkown

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### **Report Summary:**

Mr Zwahlen was participating in a club 'fly away' weekend involving ground tow operations on the Hughenden Airfield with several members of the Cairns Hang Gliding Club. The fly away weekend is an annual event with the club. Mr Zwahlen has attended several such events at this location in previous years.

The weather on the day of the accident was overcast and not conducive to X-country flying. The participants therefore engaged in several towing sessions throughout the day where they were towed to approximately 1500 ft AGL before releasing from the tow and flying a short circuit to land back on the airfield.

At approximately 5 pm Mr Zwahlen elected to have a final tow of the day. He had already undertaken several tows during the day. During this final tow the pilot encountered difficulty in releasing from the tow line. The pilot was witnessed trying to control his glider while attempting to release the tow line but was unable to do so. Witnesses report that the tow line remained attached to the pilot and glider throughout the descent and that they saw the glider pitch and dive then regain controlled flight several times throughout the descent. The pilot continued to lose height and during his descent drifted over the airfield boundary and over the trees in the next field. The pilot collided into the trees, the force of which snapped one substantial branch which severed his left leg. Shortly thereafter the pilot crashed into another tree at its base. Members of the Cairns club called 000 and rushed to assist Mr Zwahlen. Paramedics arrived within a ½ hour following the incident and soon thereafter took Mr Zwahlen to Hughenden hospital where he was later flown to Townsville hospital by the Flying Doctor service. Mr Zwahlen died four days later on the 15<sup>th</sup> of September 2005.

Inspection of the aircraft showed that Mr Zwahlen had made some special modifications to his equipment for the purpose of retracting the tow bridle in between the wing surfaces after release from tow.

Inspection of the bridle system used by Mr Zwahlen showed that he had employed some non standard equipment which included a single standard chain link used as the weak link tow ring. The bridle employed by Mr Zwahlen was found to be water ski rope, the type that is a weaved braid spliced at either end.

Inspection of the tow line release showed that the snap link on the pilot end of the tow line had sneered the ski rope, piercing the braid and consequently locking the bridle and tow line together. Inspection also indicated that the towline and V.G cord from the glider had become entangled with the V.G cord twisting around the tow line.

Inspection of the airframe and harness revealed that there was no hook knife included in the pilot equipment and that the parachute in the harness was untouched but would have in all likelihood worked if the pilot had attempted to deploy it. Witnesses state that at no time throughout the descent did they see the pilot attempt to deploy his parachute.

Witnesses confirmed that Mr Zwahlen had locked off his radio during the tow so that commands could be given directly to the driver without need to use his hands to make the transmissions. Witnesses were therefore unable to offer verbal advice during the descent.

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### ***Accident Detail:***

Witness statements from Mr Graham and others provide a detailed summary of the accident which I will not make repetitive cover of here, suffice to say that the tow went well until just after the moment when the pilot confirmed he had attempted to release at the top of the tow.

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### **Findings:**

Based on the reports from the witnesses and inspection of the equipment the following has been surmised:

1. Several modifications to a standard towing system at the pilot end had been made. The same modifications had provided no problems during previous tows.
2. During the release from the tow line the snap link on the tow line has caught the bridle, piercing the bridle's weave with the hook shape of the snap link. Had this snap link been a closed screw gate type link there would have been no chance in the bridle being caught by the snap link.
3. The bridle being made of loose weave allowed potential for the snap link to catch between the weave. The bridle in itself was not an issue but combined with the type of quick link being used there became potential for the link to snag the open weave of the bridle. Quick links have been employed in towing operations for their ease of use. However there have been other instances where the snap link has re-engaged the pilot onto the tow line after the initial release.
4. The pilot attempted to release from the top attachment of the bridle system by pulling on the V.G chord. This was another modification that the pilot had made so that by pulling on the V.G chord it would initiate the top release and via a bungy chord have the bridle retract into the sail. By extending the length of the V.G chord during this manoeuvre it gave opportunity for the V.G chord to entangle the tow line which was now hooked into the bridle by the snap link.
5. The pilot was not carrying a hook knife or other accessible means of severing the tow line if an event such as occurred in this incident were to arise. It is reported that he did have a pocket knife stored in his harness. Had the pilot been carrying a hook knife or similar tool in an accessible position the pilot would likely have been able to cut away from the tow line and fly the glider to a safe landing. It should be noted that a hook knife is strongly recommended in the HGFA Tow Manual (section 3.7.2) as a piece of equipment that should be carried in all tow operations in the case of tow release failure.
6. The pilot made use of a standard chain link in place of the recommended seamless stainless steel ring (section 3.3.1 HGFA Tow Manual).
7. Mr Zwahlen was an experienced and respected pilot in tow operations. Although it was known by fellow pilots that he was experimenting with his own tow bridle system his experience with design and use of tow equipment was respected enough to allow him to continue towing with his choice of equipment.

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### **Recommendations:**

Ian Graham, Cairns Club Safety Officer has made several recommendations as a consequence of this accident. Likewise Sgt Ian Thomson has also made several recommendations which are largely based on those made by Mr Graham. The following summarises these recommendations and provides comment on them.

**1. Ski rope employed as part of the tow bridle** – the recommendation is made by Mr Graham to eliminate the use of ski rope from all sections of the tow system. The basis of this recommendation is on the fact that the snap link hooked into the braiding of the bridle rope. Ski rope has the property of being a non stretch rope. This is a desirable attribute for bridle chord employed in towing operations.

The danger component in the tow system at the bridle end was not that of the loose weave of the ski rope but more that of the use of a snap link to attach the tow line to the bridle end of the system. If a locking ring had been used in place of the snap link there would have been no chance of the bridle being snagged after release.

It is far preferable for the join between the tow line and the bridle to have a closed screw gate type ring rather than a snap link which can inadvertently clip on to other objects which may press against the snap link opening. An example of this was seen in one such incident where the snap link clipped onto the side wire of a hang glider after the tow line was released. Safety is therefore improved if we eliminate the potential for the clipping ability of the snap link by replacing it with a screw locking ring.

The employment of the snap link in towing operations has been due to the ease of hooking up the tow line to the pilot, especially when there are multiple tows to be done in a short time. The downside of the screw gate is that the screw can become difficult (never impossible) to unscrew after tension has been placed on the ring. This inconvenience is not enough to disregard the improved safety by use of the screw gate type ring connector.

Currently there is no note in the HGFA Tow Manual regarding the tow line link to the bridle other than the use of rings at the end of ropes. The recommendation for use of screw gate type rings to be used as the connection ring between the towline and the pilot is now being considered by the HGFA Safety Committee. It is expected that an update into the Two Manual will be made following the review of this aspect of the current recommended towing systems.

**2. Leader systems** – Mr Graham recommends that a ‘leader’ be employed for all 1:1 bridle systems. The purpose of the leader is having the tow line link located further away from the pilot. This method has been reviewed and argued for many years. There is potential for the leader to cause a similar issue as did the V.G chord in this incident, ie wrap back around the tow line (usually after a weak link break). The leader can also present further difficulties for the pilot on landing when there is extra rope at the pilot end to protect from entanglements. The use of a leader is not a conclusive safety enhancement in itself.

**3. Carriage of a knife** – The recommendation for carrying a knife (in an accessible position while in flight) is very much supported. Sgt Thomson has made the recommendation that this be made mandatory at club level. The HGFA would support any club that did make this a mandatory requirement.

The carriage of a hook knife is already strongly recommended within the procedures laid out in the Tow Manual. The HGFA can not enforce local operational procedures on a daily

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basis but does constantly remind pilots of the sense in following the procedures stated in the Manuals of the organisation. The recommendation to make policy on carrying a hook knife is redundant due to the existing policy already stated in the Tow Manual.

Pilots are required to undergo formal training before being endorsed to operate firstly as a pilot in command and then as an endorsed pilot for specialised operations such as towing. During these training sessions pilots are educated to the risks and informed and skilled with the means to mitigate those risks. The carriage of a hook knife for towing operations is entrenched in those training sessions and supported in the examination for achieving the tow endorsement.

**4. Parachute deployment training** – Sgt Thomson recommends that pilots practice parachute deployment on a regular basis. Again this is something that the HGFA actively promotes and makes constant recommendation to clubs and pilots to engage in. Traditionally clubs have at least one formal parachute deployment and repack session each year.

Each year there are generally several incidents that are reported to the membership via our member magazine where pilots have had to deploy their parachutes following some incident while in flight. It seems that paragliders encounter reason to throw their parachutes more than hang gliders due to the nature of the wing type and its collapsible structure. These reports, distributed by the HGFA, have the effect of providing our membership with a greater awareness in regard to use, care, repacking and deployment of reserve parachutes. The HGFA has produced a DVD on the subject and this is being made available to Clubs and members at a minimal cost so as to further the awareness and information regarding parachute deployment and repacking.

**5. Review of the HGFA Tow Manual** – The HGFA operations manuals are living documents and as such are constantly in a state of review. New aircraft, new systems, pilots challenging the boundaries of flight, the incidents and accidents that naturally come from such challenges and the recommendations from those reports all contribute to the need to revise and update our procedures. The HGFA is currently embarking on a project to fully review all of its operational manuals and procedures with the imminent arrival of new legislation in air law. The Tow Manual is already under review and the understanding of incidents resulting during tow operations will contribute to this manual's update.

### **Conclusion**

There is no doubt that had Mr Zwahlen been carrying a hook knife this flight could have had a different outcome. The HGFA has and will continue to strongly recommend the carriage of a hook knife for all towing operations.

The use of a snap link for connecting the tow line to the pilot is considered a contributory cause to this accident. Had there been a screw gate link in place of the snap link it is unlikely that the bridle rope would have caught in the manner it did to lock the pilot back onto the tow line. The HGFA will further review the use of snap links and leaders for towing operations and update the Tow Manual according to that review.