The Gliding Federation of Australia Inc

Occurrence Summaries

01/01/2012 to 31/12/2012

Region(s): All

Club:

Christopher Thorpe
Executive Manager, Operations
The Gliding Federation of Australia Inc.

31-Dec-2012

The Gliding Federation of Australia Inc
SOAR Accident and Incident Occurrences
General Statistics

Date From: 01/01/2012
Date to: 31/12/2012

Damage	**VSA**	**NSWGA**	**SAGA**	**GQ**	**WAGA**	**Total**
Nil	5	6	5	10		26
Write-off	4			1		5
Minor	7	3	1	4	4	19
Substantial	3	3		1	2	9
Total	**19**	**12**	**6**	**16**	**6**	**59**

Injury	**VSA**	**NSWGA**	**SAGA**	**GQ**	**WAGA**	**Total**
Nil	14	12	6	14	6	52
Serious	3					3
Fatal	1			1		2
Minor	1			1		2
Total	**19**	**12**	**6**	**16**	**6**	**59**

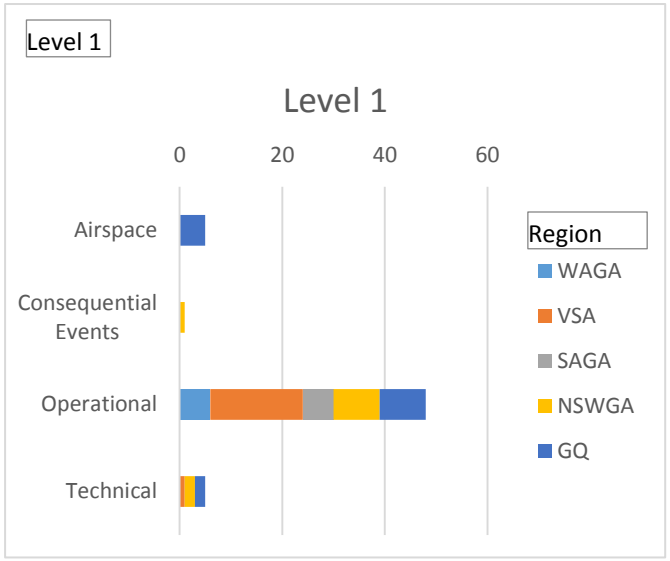
Phases	**VSA**	**NSWGA**	**SAGA**	**GQ**	**WAGA**	**Total**
Outlanding	3					3
Landing	8	4	3	6	4	25
Launch	5	5	1	1	2	14
Ground Ops	1	1	2	2		6
In-Flight	1	2		6		9
Thermalling	1			1		2

Type of Flight	**VSA**	**NSWGA**	**SAGA**	**GQ**	**WAGA**	**Total**
Cross-Country	5	2		5	1	13
Local	7	4	2	5	4	22
AEF	1	1		1		3
Ground Ops	1	1	2	2		6
Training/Coaching	3	4	2	1	1	11
Competition	2			2		4
Total	**19**	**12**	**6**	**16**	**6**	**59**

The Gliding Federation of Australia Inc
SOAR Accident and Incident Occurrences
Classification Level 1

Date From: 01/01/2012
Date to: 31/12/2012

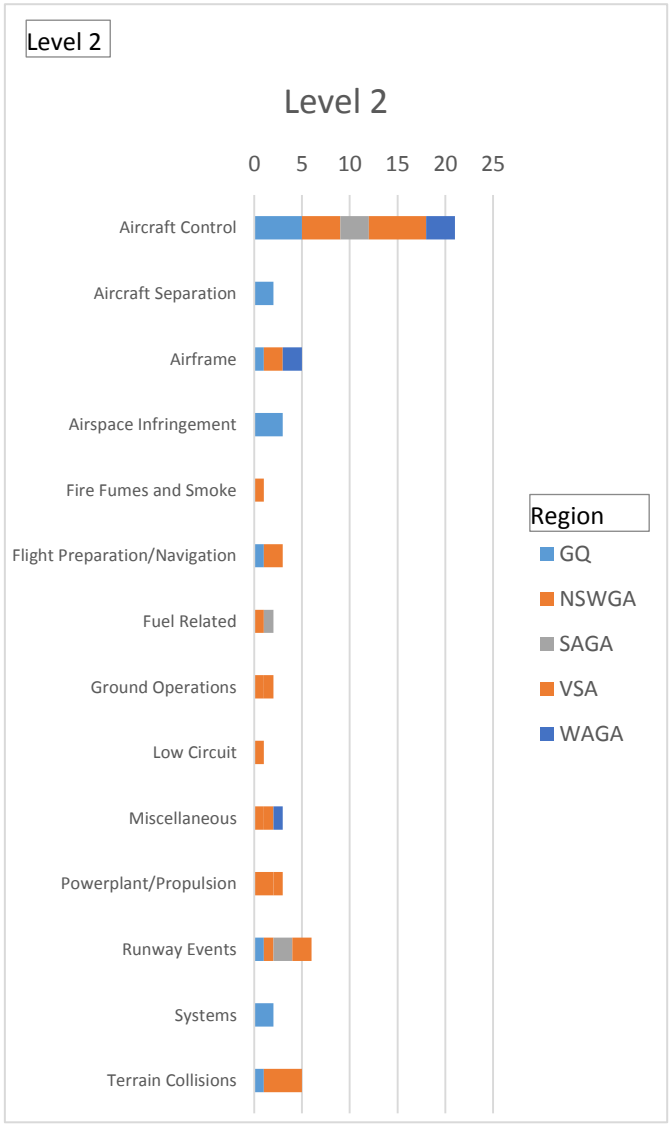
Level 1	VAG	VSA	SAGA	ISWG	GQ	Total
Airspace					5	5
Consequential Events				1		1
Operational	6	18	6	9	9	48
Technical		1		2	2	5
Total	**6**	**19**	**6**	**12**	**16**	**59**



The Gliding Federation of Australia Inc
SOAR Accident and Incident Occurrences
Classification Level 2

Date From: 01/01/2012
Date to: 31/12/2012

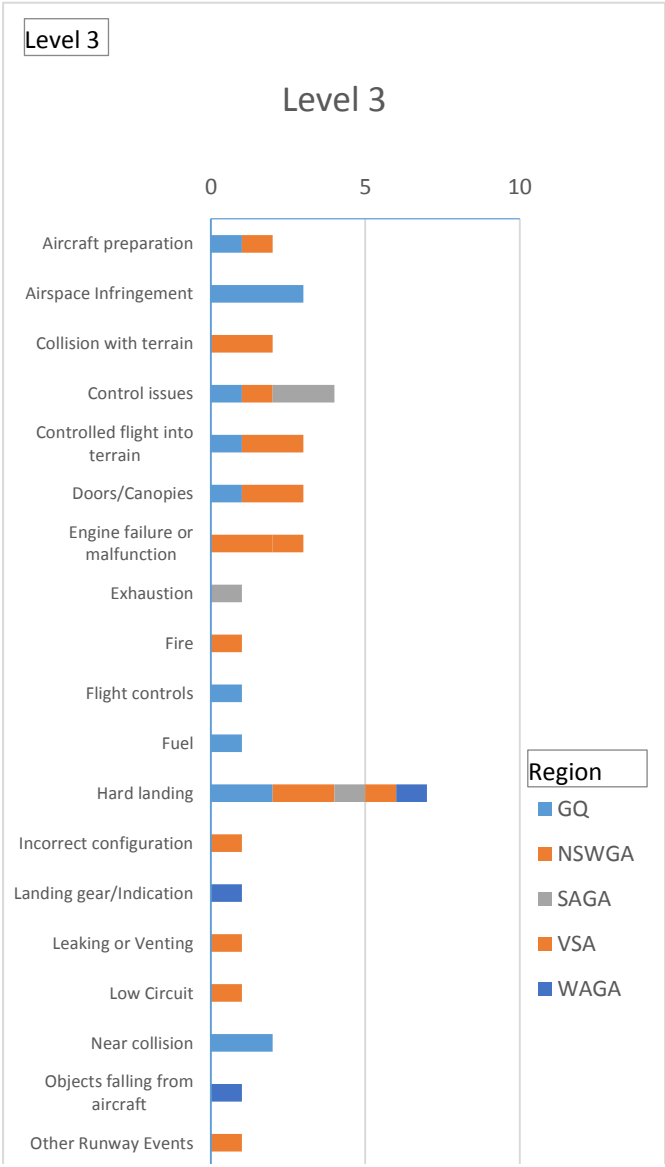
Level 2	GQ	NSWGA	SAGA	VSA	WAGA	Total
Aircraft Control	5	4	3	6	3	21
Aircraft Separation	2					2
Airframe	1			2	2	5
Airspace Infringement	3					3
Fire Fumes and Smoke		1				1
Flight Preparation/Navigation	1			2		3
Fuel Related		1	1			2
Ground Operations		1		1		2
Low Circuit		1				1
Miscellaneous		1		1	1	3
Powerplant/Propulsion		2		1		3
Runway Events	1	1	2	2		6
Systems	2					2
Terrain Collisions	1			4		5
Total	**16**	**12**	**6**	**19**	**6**	**59**



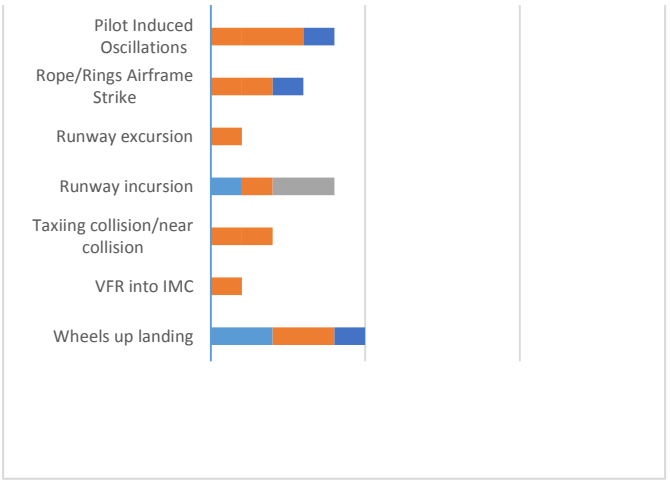
The Gliding Federation of Australia Inc
SOAR Accident and Incident Occurrences
Classification Level 3

Date From: 01/01/2012
Date to: 31/12/2012

Level 3	GQ	NSWGA	SAGA	VSA	WAGA	Total
Aircraft preparation	1			1		2
Airspace Infringement	3					3
Collision with terrain				2		2
Control issues	1	1	2			4
Controlled flight into terrain	1			2		3
Doors/Canopies	1			2		3
Engine failure or malfunction		2		1		3
Exhaustion			1			1
Fire		1				1
Flight controls	1					1
Fuel	1					1
Hard landing	2	2	1	1	1	7
Incorrect configuration				1		1
Landing gear/Indication					1	1
Leaking or Venting		1				1
Low Circuit		1				1
Near collision	2					2
Objects falling from aircraft					1	1
Other Runway Events				1		1
Pilot Induced Oscillations		1		2	1	4
Rope/Rings Airframe Strike		1		1	1	3
Runway excursion				1		1
Runway incursion	1	1	2			4
Taxiing collision/near collision		1		1		2



VFR into IMC				1		1
Wheels up landing	2			2	1	5
Total	**16**	**12**	**6**	**19**	**6**	**59**



Date	1-Jan-2012	Region	VSA	SOAR Report Nbr	S-0143
Level 1	Operational	Level 2	Terrain Collisions	Level 3	Controlled flight into terrain
A/C Model 1	Ventus 2CT	A/C Model 2			
Injury	Serious	Damage	Write-off	Phase	Outlanding	PIC Age	83

After losing final glide due to a large area of sink, the pilot elected to use sustainer to self retrieve. The sustainer engine could not overcome the high sink rate and the pilot, realising she could not clear the Hills enroute, made a late decision to land in a paddock. Flying into rising ground the pilot conducted a low turn whereupon the starboard wingtip struck the ground. The aircraft impacted at approx 40 degrees nosedown under power, followed by a ground-loop before coming to rest. The aircraft was substantially damaged. Causal factors include fatigue and high workload leading to poor decision making. This accident serves as a reminder to pilots of powered/sustainer sailplanes of the importance of understanding the performance limitations of the sailplane under power. Pilots must also ensure they allow themselves sufficient height to make a successful landing in the event something goes wrong.

Date	3-Jan-2012	Region	VSA	SOAR Report Nbr	S-0137
Level 1	Operational	Level 2	Aircraft Control	Level 3	Wheels up landing
A/C Model 1	Standard Libelle 201 B	A/C Model 2			
Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	61

After performing his pre-landing checks and while mid downwind, the pilot encountered lift and retracted the landing gear. Unable to climb the pilot decided to resume the landing and forgot to lower the

undercarriage. This incident highlights one of the pitfalls of attempting to thermal away on circuit.

Date	6-Jan-2012	Region	NSWGA	SOAR Report Nbr	S-0127		
Level 1	Technical	Level 2	Powerplant/Propulsion	Level 3	Engine failure or malfunction		
A/C Model 1	Piper PA-25-235	A/C Model 2					
Injury	Nil	Damage	Nil	Phase	Launch	PIC Age	34
While the aerotow combination was climbing through 800' AGL, the tow plane engine stopped. The tow pilot and glider pilot simultaneously released the tow rope and both aircraft landed back on the airfield safely. Investigation revealed that the mixture cable had broken, causing the engine to lean and stop.							

Date	6-Jan-2012	Region	SAGA	SOAR Report Nbr	S-0130		
Level 1	Operational	Level 2	Aircraft Control	Level 3	Hard landing		
A/C Model 1	KR-03A Puchatek	A/C Model 2					
Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	30
Glider landed heavily, resulting in the undercarriage collapsing.							

Date	14-Jan-2012	Region	NSWGA	SOAR Report Nbr	S-0131		
Level 1	Operational	Level 2	Runway Events	Level 3	Runway incursion		
A/C Model 1	Piper PA-25-235	A/C Model 2	Tecnam P2002 Sierra				
Injury	Nil	Damage	Nil	Phase	Launch	PIC Age	59
Just as an aerotow combination commenced launch, a RA-Aus Tecnam announced its intention to enter the runway. Another tow pilot waiting to line up for next launch got on the radio and asked the Tecnam pilot to hold short of the runway. The Tecnam pilot did not hear the radio call, entered the active runway and taxied away from the launch point then exited to the left under the path of the now-airborne tow combination. The tow pilot decided that proceeding with the launch was better than aborting as he had lateral separation, and the tow combination cleared the Tecnam by approximately 50 feet. Contributing factor was that the Tecnam pilot's headset did not match the aircraft radio (so calls were not heard).							

Date	14-Jan-2012	Region	VSA	SOAR Report Nbr	S-0134		
Level 1	Operational	Level 2	Ground Operations	Level 3	Taxiing collision/near collision		
A/C Model 1	DG-600	A/C Model 2					
Injury	Nil	Damage	Minor	Phase	Ground Ops	PIC Age	57
While being towed behind the car, the glider's right-hand wingtip hit a post. As a consequence of the impact, the glider rotated sufficiently for the left hand wing to collide with the towing vehicle. The vehicle driver did not pay sufficient attention to obstacle clearance while taxying.							

Date	15-Jan-2012	Region	VSA	SOAR Report Nbr	S-0149		
Level 1	Operational	Level 2	Terrain Collisions	Level 3	Collision with terrain		
A/C Model 1	IS-28B2	A/C Model 2					
Injury	Serious	Damage	Write-off	Phase	Landing	PIC Age	78
Pilot deployed airbrakes during late downwind and maintained them open. During the turn onto base leg at about 450ft AGL the pilot allowed the speed to decay resulting in the aircraft stalling, pitching down and impacting the ground in a nose-down attitude. It was noted post crash that the undercarriage had not been							

lowered. The pilot did not complete his pre-landing check and did not maintain control of the aircraft during the turn onto base leg. The pilot could not explain his actions nor why appropriate corrective actions were not taken.

Date	27-Jan-2012	Region	VSA	SOAR Report Nbr	S-0140		
Level 1	Operational	Level 2	Aircraft Control	Level 3	Pilot Induced Oscillations		
A/C Model 1	Grob G 103 Twin II	A/C Model 2					
Injury	Nil	Damage	Substantial	Phase	Landing	PIC Age	56

During the landing and while flying at low height at flying speed, the pilot opened the airbrakes causing the aircraft to pitch nose down and the nosewheel striking the ground. The glider rebounded into the air and the pilot proceeded to PIO down the runway. The aircraft fuselage suffered severe cracking forward of the fin. The PIC had resumed gliding from a several year hiatus and had performed well during revalidation flights. His revalidation training did not revisit handling of bounced landings and the L3 Instructor who subsequently flew with the pilot identified poor thermalling technique, poor lookout during thermalling and poor circuit planning. This incident highlights that while experienced pilots may exhibit good skill levels, Instructors should undertake sufficient checking to determine their ability to operate under adverse conditions.

Date	29-Jan-2012	Region	VSA	SOAR Report Nbr	S-0139		
Level 1	Operational	Level 2	Airframe	Level 3	Doors/Canopies		
A/C Model 1	DG-500 Elan Orion	A/C Model 2					
Injury	Nil	Damage	Minor	Phase	Launch	PIC Age	62

During an Air Experience Flight the rear canopy came open during aerotow launch. The command pilot released from tow and landed ahead on the airfield. It is thought that an inexperienced ground crewman did not properly lock the rear canopy, which can be difficult to secure in the heat. Alternatively, the student inadvertently opened the canopy instead of opening the clear view for ventilation.

Date	29-Jan-2012	Region	NSWGA	SOAR Report Nbr	S-0141
Level 1	Technical	Level 2	Powerplant/Propulsion	Level 3	Engine failure or malfunction
A/C Model 1	SZD-50-3 Puchacz	A/C Model 2	Piper PA-25-235		
Injury	Nil	Damage	Nil	Phase	Launch	PIC Age	41

During the aerotow launch, the tug lost power just after the glider had left the ground but before the tug left the ground. The instructor in the glider noticed the rope went slack and took control, releasing the tow rope. The tug diverted to the left and released the tow rope. The glider diverted right and landed straight ahead. The tug engine was inspected but no fault could be found.

Date	6-Feb-2012	Region	VSA	SOAR Report Nbr	S-0144
Level 1	Operational	Level 2	Runway Events	Level 3	Other Runway Events
A/C Model 1	LS8-18	A/C Model 2			
Injury	Nil	Damage	Nil	Phase	Outlanding	PIC Age	47

During a competition cross-country flight, the pilot elected to outland at a regional airport. The pilot made the normal circuit calls but was on the wrong CTAF. Also unknown to the pilot, the airfield was closed. The aerodrome operator reported the incident to CASA. GFA investigation revealed the aerodrome operator had not displayed the airfield closed markers and that the competition organisers were unaware of the NOTAM closing the aerodrome. In cases of necessity, a glider may be landed in any place having adequate approach paths and landing surfaces, and landing at such a place is not considered of itself an accident or incident.

Date	6-Feb-2012	Region	VSA	SOAR Report Nbr	S-0147

Level 1	Operational	Level 2	Runway Events	Level 3	Runway excursion		
A/C Model 1	Janus	A/C Model 2					
Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	72
Upon return to the airfield from a competition cross-country flight, the experienced pilot was landing long in accordance with standard competition operating procedures. The pilot touched down at speed and in an attempt to extend the ground roll he closed the glider's airbrakes. The glider became airborne and due to mishandling by the command pilot, the glider bounced about five times as the pilot attempted to correct the aircraft's reaction with an over-correction in the opposite direction (pilot induced oscillation). The aircraft suffered substantial damage to the nose wheel. Potential casual factors include fatigue and low currency.							

Date	18-Feb-2012	Region	VSA	SOAR Report Nbr	S-0150		
Level 1	Operational	Level 2	Flight Preparation/Navigation	Level 3	Aircraft preparation		
A/C Model 1	SZD-48-3 Jantar Standard 3	A/C Model 2					
Injury	Nil	Damage	Nil	Phase	In-Flight	PIC Age	33
After a soaring flight of around 1.5 hours in the local area, the pilot decided to conduct a few flight manoeuvres to lose height on his return to the airfield. The pilot completed a couple of stalls and tight turns, and a high speed run. At around 4,000ft and while contemplating doing a sideslip, the pilot heard a loud bang and the aircraft began to shake. The control column felt loose and the pilot observed the wings flexing up and down (flutter). The pilot contemplated abandoning the aircraft but was able to satisfy himself that the main controls were responsive. The pilot lowered the undercarriage and found that opening the airbrakes reduced the flutter. A wide circuit with flat turns was flown and the aircraft was landed safely. Post flight inspection revealed the left-hand aileron pushrod had disconnected in flight. The pilot advised that he rigged the aircraft that morning and did not connect the left aileron pushrod correctly. The pushrod connection was in place but not locked. Contributing factors include limited experience rigging the aircraft, connections being in a position that prevented visual inspection, and ergonomics of the connectors enabled them to pass a second inspection while the locking mechanism was not fully engaged.							

Date	26-Feb-2012	Region	VSA	SOAR Report Nbr	S-0155		
Level 1	Operational	Level 2	Airframe	Level 3	Doors/Canopies		
A/C Model 1	Grob G 109	A/C Model 2					
Injury	Nil	Damage	Minor	Phase	Thermalling	PIC Age	65
The glider's canopy opened and departed the aircraft while thermalling. Reason not disclosed.							

Date	2-Mar-2012	Region	GQ	SOAR Report Nbr	S-0153		
Level 1	Technical	Level 2	Systems	Level 3	Fuel		
A/C Model 1	T61A	A/C Model 2					
Injury	Nil	Damage	Nil	Phase	Ground Ops	PIC Age	67
During DI the glider's fuel sight glass was found to be discoloured, thereby preventing the pilot from adequately observing fuel state.							

Date	9-Mar-2012	Region	WAGA	SOAR Report Nbr	S-0154		
Level 1	Operational	Level 2	Miscellaneous	Level 3	Rope/Rings Airframe Strike		
A/C Model 1	ASK-21	A/C Model 2	Piper PA-25-235				
Injury	Nil	Damage	Substantial	Phase	Launch	PIC Age	72

While practicing a 'hook-up' procedure, the student pilot returned to high tow position without keeping the rope tight. Excessive slack developed in the rope, which trailed back under the left wing. The tow pilot commenced a climbing turn which resulted in the rope passing up and over the rear of the port wing. The rope cut into the trailing edge of the wing and then broke. The Instructor took control and landed the glider safely with the rope still attached to the wing. This incident highlights the importance of Instructors taking control before the situation becomes irretrievable, and to be prepared to release the rope if a loop develops and immediately turn away to achieve safe separation.

Date	12-Mar-2012	Region	NSWGA	SOAR Report Nbr		S-0159	
Level 1	Operational	Level 2	Fire Fumes and Smoke	Level 3		Fire	
A/C Model 1		ASH - 25 M Jet		A/C Model 2			
Injury	Nil	Damage	Nil	Phase	Launch	PIC Age	72
During launch the pilot noticed abnormal engine readings and saw flames coming from jet engine via a monitor. The pilot shut down the engine and, after indications the exhaust fire was extinguished and temperatures back in the normal range, the engine was retracted. The pilot continued his flight uneventfully. Subsequent investigation led to further engine tuning.							

Date	17-Mar-2012	Region	NSWGA	SOAR Report Nbr		S-0158	
Level 1	Operational	Level 2	Ground Operations	Level 3		Taxiing collision/near collision	
A/C Model 1		Duo Discus		A/C Model 2			
Injury	Nil	Damage	Substantial	Phase	Ground Ops	PIC Age	64
While being towed by a car, the glider's wingtip hit a pole and VHF antenna resulting in substantial damage. The pilot did not pay adequate attention to obstacle clearance while taxying the aircraft.							

Date	1-Apr-2012	Region	GQ	SOAR Report Nbr		S-0156	
Level 1	Operational	Level 2	Aircraft Control	Level 3		Hard landing	
A/C Model 1		Astir CS		A/C Model 2			
Injury	Nil	Damage	Substantial	Phase	Landing	PIC Age	19
Pilot became pre-occupied with another glider flying a parallel circuit. The pilot extended his circuit to allow room for the other glider but allowed his speed to decay during final approach. The aircraft landed heavily, resulting in the undercarriage collapsing. Potential causal factors include low hours pilot, high workload, and distraction.							

Date	1-Apr-2012	Region	VSA	SOAR Report Nbr		S-0160	
Level 1	Operational	Level 2	Terrain Collisions	Level 3		Collision with terrain	
A/C Model 1		PZL Bielsko SZD-50-3 Puchacz S/N:B1979		A/C Model 2			
Injury	Fatal	Damage	Write-off	Phase	Launch	PIC Age	59

GFA FIELD INVESTIGATION - FACTUAL INFORMATION

On 1 April 2012, at 1518 Eastern Standard Time, a PZL Bielsko Puchacz glider was being used by the Grampians Soaring Club for flight training at Ararat aerodrome, Victoria. A Gliding Federation of Australia (GFA) Level 2 Instructor occupied the rear seat of this tandem glider. Shortly after take-off at a height of about 100ft above ground level (AGL) the glider was observed to commence at least two divergent excursions to the left and then right of the towplane centreline, culminating in the towline weak-link breaking at an estimated height of 200ft-250ft AGL. The glider was then observed to return to 'wings level' flight and commence a left-hand turn. During the turn the glider's left wing dropped, the nose pitched down and the glider impacted the ground in a steep nose-down attitude. Both occupants suffered fatal injuries and the glider was seriously damaged. The Australian Transport Safety Bureau was notified shortly after, but declined to investigate. A GFA Field Investigation was undertaken the following morning to assist the Police.

Pilot Information

At the time of the accident, the command pilot held a GFA Level 2 Instructor authorisation with about 1,100 hours total time. He obtained his Instructor Rating in the mid-1990s and maintained his rating up to the time of the accident. His last revalidation flight had been carried out on 12 November 2011. The student pilot started gliding in February 2012 and by the time of the accident had flown on seven instructional flights for just under three hour's aeronautical experience. Her logbook revealed she had received an introduction to the flight controls and was developing her skills in controlling the aircraft. On the flight prior to the accident flight she had been introduced to flying the aerotow from about 200ft AGL.

Aircraft information

The aircraft was maintained by authorised GFA Airworthiness Inspectors. The last mandatory annual inspection of the aircraft was carried out in September 2011 and the inspection record dated 18 September 2011 confirmed compliance with all current and recurring Airworthiness Directives. At the time of this inspection the aircraft had flown 13,822 flights for 5,599 hours. The inspection report also recorded that the rear rudder pedals had been modified in accordance with GFA document "Puchacz-2006-Rear Rudder Pedal, Issue 1 (May 2009)". The aircraft had been given a Daily Inspection by the command pilot in accordance with GFA operational procedures prior to the first flight of the day. During this inspection a scheduled 100 hourly maintenance inspection was carried out, which required the glider to be de-rigged to facilitate inspection and lubrication of the control circuit bearings. The glider was reassembled and the aircraft's Maintenance Release was signed by the command pilot and another qualified inspector to certify that an independent inspection had been completed for correct assembly, locking and sense of operation.

Meteorology

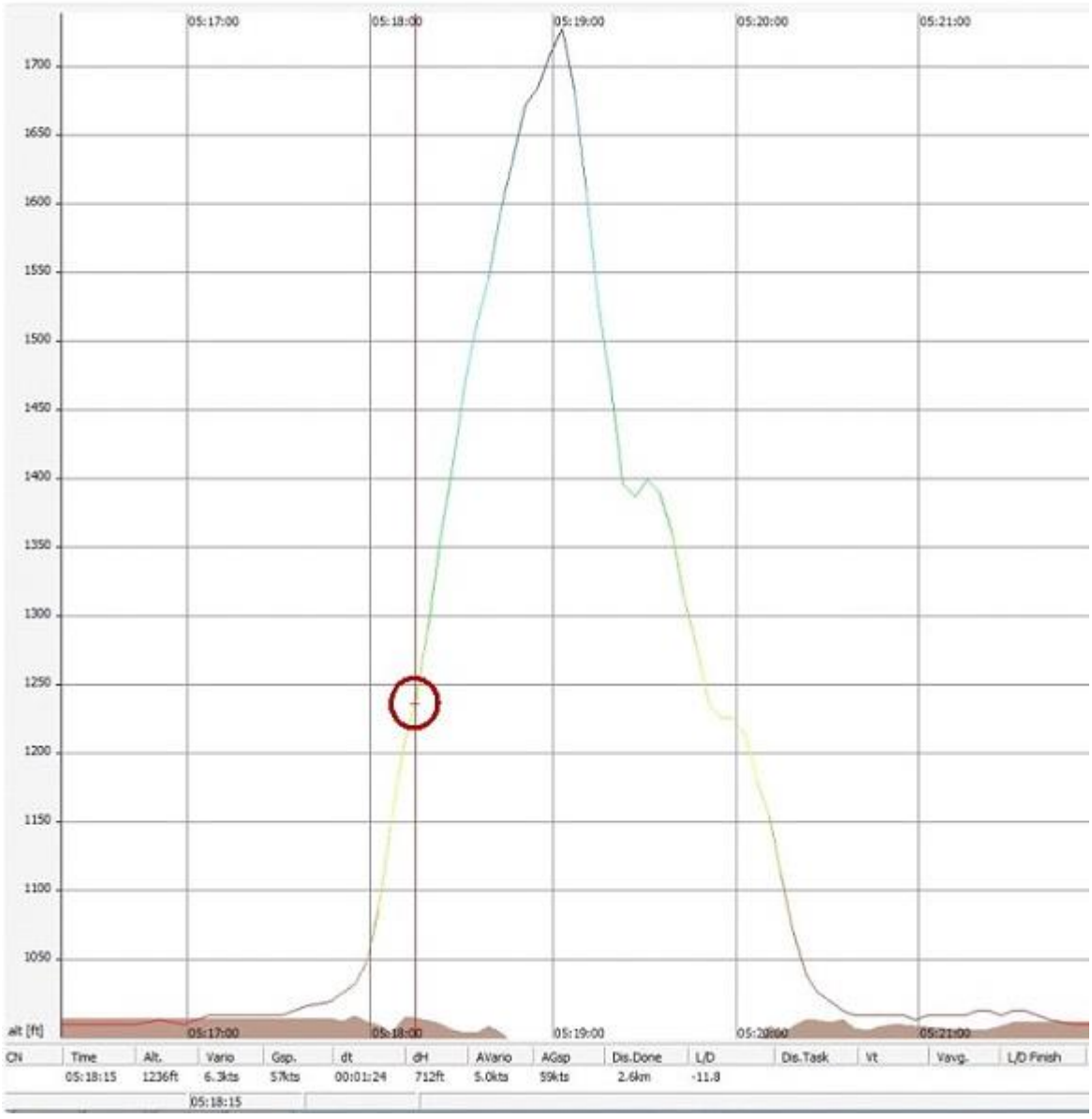
The weather at the time of the accident was good visual meteorological conditions (VMC). The wind was light from 153 degrees (SSW) at 3 knots. Weather was not considered to be a factor.

Flight data recorder

Both the glider and tow plane carried a GPS based traffic and collision-warning system (FLARM) which was

capable of logging the flight path and altitude. The unit in the glider was retrieved by the Police relatively undamaged. Several log files were downloaded from the unit the following day at the Police Station. While log files were recorded for the previous three flights that day, no file was recorded for the accident flight. Club members who were first on the scene of the accident reported the glider's power was switched on and local aircraft traffic reports were heard through the aircraft radio. Since the unit was automatically activated when the aircraft power was switched on, it was determined the unit should have been capable of recording a log file. The GFA contacted the manufacturer of the unit to ascertain why a log may not have been recorded. The company director advised the most likely reason a log was not recorded was because the unit had not acquired satellites. The unit can take several minutes to acquire satellites when it has been switched off for a period of time. The pilot who flew the previous flight in the aircraft confirmed the glider had been parked with the power off for at least 30 minutes prior to the accident flight. The unit in the towplane was interrogated by members of the Club and a log file was downloaded for the accident flight that confirmed the time of launch and track flown. Review of this log file trace overlaid on a "Google Earth" satellite picture of the aerodrome revealed the weak-link in the tow rope would have failed between 40 and 50 seconds into the flight at a height of between 200ft and 300ft AGL. It should be noted that while GPS altitude and track cannot be relied upon with any accuracy, in this case the heights and track recorded are consistent with witness observations.

Towplane GPS altitude record and estimated point of release



Medical information

The command pilot's last medical declaration was dated 12 October 2011, in which he declared that he was not suffering from any physical condition that would preclude him from operating a glider as pilot in command. The declaration also included an undertaking that in the event of him contracting any physical condition precluding him from operating a glider as pilot in command, that he would cease flying in that capacity while the condition makes it unsafe for him to do so. The student pilot made a similar medical declaration on her Membership Application form dated 12 February 2012. On the day of the accident the command pilot was described as being in a good frame of mind, quite jovial and in good health. Witnesses reported that the command pilot was still conscious when they reached the accident site. These details were reported to the Forensic Pathologist who undertook the post-mortem examination. The Pathologist's report did not identify any existing preconditions for incapacitation. The post-mortem examination did not identify any disease or indicators of likely physiological impairment, and no alcohol or drugs were identified in the

toxicological analysis.

OTHER INFORMATION

Student Pilot

On the morning of the accident the Student Pilot had two instructional flights with a GFA Level 1 Instructor in the accident aircraft. The Level 1 Instructor advised that her flying was of a good standard considering her level of experience. He felt she was coordinating her turns well, could hold speed and attitude in a turn, and was trimming the aircraft satisfactorily. During these flights the student was introduced to the stall and the associated buffet, which he believes was fully understood. The Level 1 Instructor said that he was of the opinion the student had a good skill level possibly developed when flying with her father before she formally took up gliding. On her second flight of the day, the command pilot on the fatal flight assisted by hooking up the glider and running the wing during launch . He was not present for the pre-flight briefing but was present when the student went through her pre-flight check-list and assisted her by prompting when she had difficulty remembering a particular check. On this flight the Level 1 Instructor allowed the student to hold the wings level with ailerons while he flew the launch. He stated that the student handled the task well and that when the aircraft was at about 200ft AGL he handed her full control. He recalled she handled the tow reasonably well but at around 1,000ft AGL the aircraft got a little low in relation to the normal towing position, requiring the Level 1 Instructor to prompt her into the correct position.

Command pilot

Just prior to midday, the command pilot took a short-term member for a flight in the Club's Janus two-seat glider. The member recalled the command pilot was in a good frame of mind and during the flight he was quite jovial, talkative, and answered questions. The command pilot handed over control to the member who flew the glider briefly, and the member commented that the command pilot resumed control confidently and with authority. The flight lasted for one hour, after which the command pilot went to the clubhouse for lunch.

Aircraft

The aircraft had flown three flights prior to the accident flight without incident. The penultimate flight lasted one hour and, upon landing, the glider was parked to the side of the runway with the power turned off.

ANALYSIS

Pre-Flight

Following a request by the student's father to take her for a flight, the Command Pilot spoke with the student and they agreed to go flying. The club member who had previously flown the aircraft some 30 minutes earlier, accompanied the command pilot to the glider and together they pushed it onto the flight line in readiness for flight. The command pilot conducted a pre-flight briefing with the student that lasted about 15 minutes. The specifics of the briefing were not known but it was usual for the command pilot to outline the exercises that would be flown. The student appeared in good spirits and was concentrating on what she being told. Witnesses recalled she answered questions put to her by the command pilot and it was noted that she occasionally needed prompting. The student was observed to fit one ballast weight (equivalent to 6.3kg on the front pilot seat) into the front of the aircraft and then complete her pre-boarding check. Upon completion of the check she and the command pilot climbed into the glider and strapped themselves in. The command pilot was seated in the rear seat and the student occupied the front seat, which is the usual seating arrangement for training flights. The student completed her pre take-off checks and then locked the canopy ready for the launch. The tow rope was connected to the aircraft and was confirmed to be securely attached. With this check completed satisfactorily, the person assisting the launch checked that the sky was clear for launch and then proceeded to the glider's wingtip where he gave the 'take-up slack' signal to commence the launch.

Flight

Most witnesses recalled the ground run was stable and direction was maintained. The glider lifted off smoothly and maintained a height of between 4ft to 10ft above the ground in line-astern of the towplane. The combination of glider and towplane climbed in the standard low tow position to a height of 100ft AGL, at which point witnesses observed the glider commence a divergent oscillation manoeuvre from left to right and back again. During this manoeuvring the weak-link was believed to have broken. Although it cannot be

determined with any certainty, it is possible the command pilot handed control to the student just prior to the divergent oscillation commencing, as it is unlikely a skilled pilot would have manoeuvred in this manner. The pilot of the towplane recalled that during the glider's manoeuvring he needed to use forward trim to counter the stick forces caused by the downward pull of the glider. He recalled the weak-link broke with a 'bang', resulting in the towplane pitching forward when the load was removed. When the towplane pilot looked into his rear vision mirror following the break he noticed the glider to be wings level and in straight flight. Witnesses on the ground also observed the aircraft resume straight and level flight after they believed the weak-link had broken. From these observations it is most likely the student was on the controls during the divergent oscillations, and that following the weak link break the command pilot had resumed control of the glider and re-established stable flight. One of the witnesses on the ground recalled that after flying straight and level for 2 or 3 seconds, the glider was then observed to enter a banked turn to the left. This is consistent with the observation of one other witness. Witnesses recall the bank was initially shallow and no more than 30 degrees. Two witnesses were of the opinion that the glider was flying normally. The descriptions thereafter from most of the witnesses were similar in that the glider was observed to drop its left wing and nose and dive into the ground in a left-hand spiral. The aircraft completed about 320 degrees of a turn from the moment the turn commenced. This observation describes a classic stall and incipient spin entry.

Aircraft

Examination of the occurrence site and wreckage indicated that the glider was in a left-hand spin when it struck the ground in a right-wing-low, very steep (approximately 70 degrees) nose-down attitude. After the initial impact the aircraft rebounded rearwards approximately two metres. The aircraft came to rest right side up on an easterly heading. The leading edges of both wings left ground scars, and the nose left a shallow indentation in the ground. The fuselage, forward of the wing leading edge, which includes the cockpit, was mostly destroyed at impact. The wings remained attached to the fuselage and the tail boom was broken and displaced slightly to the right. The rudder had broken away from its support structure due to impact loads. The glider was equipped with four-point lap and shoulder restraints, which were worn by both occupants. All flight control surfaces were accounted for at the accident site. While there were multiple overload failures of the flight control system in the fuselage and cockpit areas, control continuity was established. It was also noted that the left and right airbrakes were partially deployed but their lack of damage is indicative of them being in the closed position prior to impact and they most likely deployed when control circuit integrity was lost.

Rudder pedal modification

The SZD 50-3 Puchacz has the known issue of the possible bending of the turnbuckle ends attaching the rearwards running rudder cables to the rear rudder pedals. The danger of the rear occupant's foot pressing sideways at the top of the rudder pedal and onto the turnbuckle end leading to high loads and eventual fracture of the turnbuckle end is advised in the factory bulletin (BE-054/SZD-50-3/2003). Subsequently, the manufacturer issued Mandatory Bulletin BE-057/SZD-50-3/2006 in October 2006 to deal with further issues with the original design of the rudder cable attachment to the rudder pedal. The GFA considered the manufacturer's attempts to deal with the original problem did not introduce better integrity and an improved modification was approved. This modification was implemented during the aircraft's annual inspection in September 2011. In order to discount failure of the modification as a casual factor in this accident, photographs of the rear rudder pedals taken by the Victoria Police at the accident site were reviewed. These photographs confirmed the modification was intact on both rear rudder pedals, and the cables were still secured.

Left Rudder pedal with modification intact

Right Rudder pedal with modification intact

Canopy

One of the Club members mentioned that the canopy locking levers had become partly undone during a sideslip manoeuvre a few years ago. Research revealed a Puchacz canopy opened in flight on a Canadian glider in 2004 during side-slipping with airbrakes out, and that a canopy opened on another Canadian glider during a spinning manoeuvre. In August 2000 the British Gliding Association (BGA) issued a recommendation to inspect canopy latch operating levers and latches for worn or damaged parts in response to a canopy opening in flight. Subsequently in 2003 the BGA issued a technical note to modify the

locking mechanism with the installation of a small spring to pre-load the latching handle into the locked position (BGA 2003/11). These incidents all involved worn or damaged locking levers and latches. The GFA is also aware of at least one reported incident in Australia involving a canopy coming open in flight but investigation concluded it more likely that the locking lever was knocked open by the student pilot rather than worked loose. It is possible that during the accident flight the glider was subjected to side winds similar to those associated with side-slipping due to mishandling of the aerotow. In such circumstances the canopy may become unlocked if the locking mechanism was worn or damaged. A canopy coming open in flight would be a significant distraction for the command pilot, especially when the pilot is already under stress from a cable break at low height. The remains of the canopy were confined to the accident site at or near the point of impact. The canopy had been extensively fragmented in the crash, indicating it was attached to the glider at the moment of impact. However, it could not be determined that the canopy was locked, as analysis of the locking mechanism was inconclusive. Enquiries of the two pilots who flew the glider on the three flights preceding the accident flight revealed the locking mechanism to be working correctly (positively locking) and in good order. While it is unlikely the canopy came open in flight, there is no evidence to confirm this view.

Weight and balance

The glider has two purpose-made ballast blocks that screw into formed slots on the floor beneath the front instrument panel. Each block is the equivalent of 6.3kg on the front pilot seat. One or more blocks may be used by lightweight pilots to bring the front seat load to, or above, the placarded minimum weight. In addition, small pilots must have a cushion or parachute behind their back to maintain a safe forward Centre of Gravity (CG) position. On the accident flight the cockpit load included the Instructor (92 kgs) and student (51 kgs) plus one ballast weight. According to the aircraft placards a minimum front pilot weight of 50kgs was required. This was in line with the most recent Weight & Balance record dated 22 June 2006. The student was of small stature and flew with three cushions in addition to the aircraft cushion behind her back, effectively moving her forward about 75 to 100 millimetres. Based on the aforementioned, the glider was well within the weight and CG limits laid down by the manufacturer. An independent review of the aircraft loading was undertaken by the GFA Airworthiness Department. The review utilised the Weight & Balance report dated 22 June 2006 and was based on the actual pilot weight and loading configuration used on the accident flight. The review confirmed that the aircraft CG was within 63% of the range specified by the manufacturer and was in a safe configuration for flight.

Harness

During the flight both pilots were restrained by a combination lap and shoulder harness. Any significant longitudinal impact in this type of aircraft usually results in the destruction of the cockpit area. The impact forces in this case were so great that the front occupant's seatbelt attachment points failed. Conversely, the rear occupant's seatbelt attachments were intact.

The tow rope

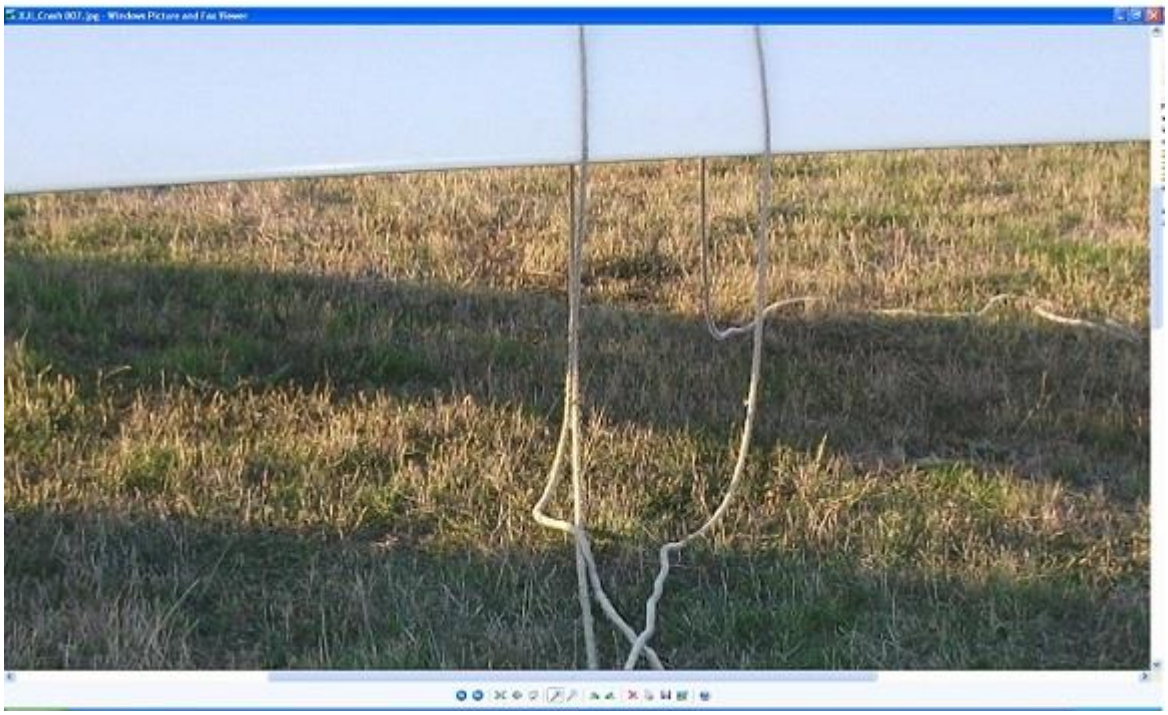
Aerotow ropes are usually of polypropylene or polyethylene, both of these materials being adequately strong and with enough elasticity to give a good ride for the glider pilot without excessive stretch of the rope. One end of the rope has a set of rings spliced in to connect the rope to the release in the nose of the glider. The other end of the rope has a weak-link, fitted with a set of rings to connect the rope to the towplane's release. Weak-links are fitted to aerotow ropes for the protection of both the glider and the towplane and are designed to break when maximum towing loads are reached. The Flight Manual of the Callair towplane being used by the Grampians Soaring Club has a maximum weak-link strength of 450 kgs. The Puchacz glider has a maximum weak-link load of 690kgs, which is well above that required by the towplane. The rope in use on the accident flight was 12mm polypropylene. The weak-link was 6mm polypropylene, doubled wrapped. The Police Investigator took the rope and weak-link to a testing laboratory to test the breaking strain of the weak-link. Unfortunately, a test could not be undertaken as there was insufficient length in the weak-link to fit the testing machine.

The rope break

When a rope breaks at the weak-link the disconnected end will fall earthwards. If it breaks under tension at the towplane end it can whip back towards the glider. In some circumstances it is possible for the rope to fall

over the wing of the glider. There is a danger that a rope falling over a wing could lodge between the wing and aileron causing the aileron to lock and make control of the glider difficult. It was clear from examination of the aerotow rope that the weak-link had failed under load. The rings were still attached to the towplane. The 'glider end' rings of the aerotow rope were found near the front of the fuselage. The nose release was still functional after the accident but there was evidence of impact damage to the release actuating lever. It is most likely the rope remained attached to the glider after the weak-link broke and released from the glider at the moment of impact with the ground. After impact the rope was found draped around the left wing but there were no 'witness' marks in the aileron to wing cut-out to indicate the rope interfered with the aileron or played a role in the accident. Post-accident review indicates the rope was most likely trailing below the aircraft, and upon impact it fell and draped itself over the left wing. Normally following a rope break the pilot would release the rope from the glider to minimise the likelihood of it fouling in fences or trees during the landing. Investigation revealed some Club members were in the habit of bringing the rope back with the glider to avoid losing same when a break occurred during launch. In this case it appears the pilot either deliberately chose not to release the rope or was otherwise pre-occupied.

Close Up clearly showing rope draped over the wing.



In-flight emergencies

While pilots are trained to consider emergency options prior to take-off, a pilot's workload becomes very high when a release at low-level occurs. Not only does he have to fly the aeroplane but he also needs to review outside the aeroplane for safe landing options. The Puchacz sink rate in still air is 187 feet per minute at 54 knots, which would have been the standard circuit speed for the prevailing conditions. At this rate of descent, the command pilot has little time to assess his options and, under stress, may make simple judgemental errors. It is known that pilots under stress and manoeuvring at low level tend to overuse their rudders, resulting in yaw close to the stall speed that could lead to a spin.

GFA Spin training

Witnesses estimated the glider was banked 30 degrees during the initial turn. While classic stall/spin situations arise during shallower banked turns, gliders can and will spin from a well-banked, unbalanced turn at airspeeds normally considered to be safe. They will also spin in circumstances where a turn is commenced from the correct attitude but prior to safe speed being achieved. Accidents caused by loss of control at too

low a height for recovery are not uncommon in gliding. This defines the most important objective of spin training, which is spin prevention. However, correct and prompt recovery action is of no value if the glider is too low for it to work. The only answer is to prevent it spinning in the first place. However, spin prevention is not just a matter of flying a glider in such a way that a spin cannot occur, in other words keeping the speed up and never flying in an uncoordinated manner. Pilots do make handling and judgemental errors, especially under stress, and the GFA training syllabus recognises that it is necessary to cover all the possibilities during pilot training. The GFA pilot training syllabus covers the development of the spin and teaches the pilot that it can be recovered at any stage. Solo pilots are tested on their spin recovery during Annual Flight Reviews.

Puchacz stalling and spinning characteristics

The general opinion of Puchacz pilots is that the Puchacz enters a spin quite easily and will also readily recover from a spin when the standard spin recovery technique is applied. The rate of rotation is higher than in many other training gliders in current use and the Puchacz spins with a steep, nose-down attitude, losing about 300 feet per full rotation. In 1994 the British Gliding Association sponsored a low speed handling trial of the Puchacz. The trial was flown by test pilots and instructors in early 1994 under the control of the then Defence Research Agency at Farnborough. The trial confirmed that the glider was compliant with JAR 22 (Regulation for the certification of gliders and motor gliders); however, it considered that two areas were worthy of additional comment. The trial considered the aircraft to be only marginally compliant in respect of stalls during turns and noted that avoidance of uncontrolled rolling and spinning off a turn was reliant on pilot awareness and skill. The trial also noted that height loss in a spin was significantly greater than on other types and that this was largely due to the steep attitude (70 degrees nose down) of the developed spin.

The weak-link break

A rope break in itself should not have led to this accident. Rope-breaks on aerotow are not common but can and do occur, especially if the glider gets out of position and puts strain on the rope when returning to the normal position behind the towplane. The GFA Instructor's Handbook states *"The first priority following a rope-break is to ensure that the speed does not decay below 1.5Vs . The next job for the pilot is to decide how to use the available height as safely as possible. Very low rope-breaks necessitate a straight-ahead landing; some strips may allow such a landing up to a considerable height, say 300 or 400 ft. Above the cut-off height for a straight-ahead landing (and this height will vary from day to day, from towplane to towplane and from strip to strip), a modified circuit of some description will be possible. The degree of modification will vary in accordance with the previously-mentioned factors; a rope break just above the cut-off height will probably mean a 360 degree turn and a landing ahead or maybe two S-turns and a landing ahead, whereas a higher rope-break will enable an almost normal circuit to be made."* In the case of this accident, it seems the command pilot managed to restore the aircraft to straight and level flight but it is not known whether he had achieved a safe speed near the ground of 1.5Vs before he commenced his turn. It can take a glider a few seconds to regain a safe speed after the nose has been lowered to flying attitude. In order to turn the pilot will bank the aircraft and use rudder to balance the turn. As the angle of bank increases, the laws of aerodynamics dictate the speed at which the glider will stall also increases. Therefore, if a turn is commenced before a safe speed is attained, there is a high probability the glider will stall as the angle of bank increases. Introducing yaw with rudder at the stall leads to the development of the spin. From the position where the glider became detached from the towplane, there was ample space available to land the glider straight ahead. Why the command pilot elected to turn back will never be known. However, experience has shown that many pilots turn for the very good reason that they are not sure of being able to land straight ahead. Traditional training regards the straight ahead landing as being the easy one and it usually is. However, normally only one or two are practised and these are usually from a height where a straight ahead landing is the obvious choice. The problem comes when the glider is a little higher up the launch and the pilot, having recovered to the approach speed and stabilised the attitude, does not think he can land ahead, or in any event is unsure of it. It is possible this scenario faced the pilot in command.

Aerotow training

As previously noted, it is likely the student was flying the aerotow launch. A review of the student's logbook revealed she had seven instructional flights prior to the accident flight and only had very basic flight skills. Her instructor on the seventh flight introduced the student to aerotow from about 200ft AGL. On that flight

he felt she was handling it well for her level of experience. Witnesses all observed the glider get out of position during the tow and wander from side to side. This is quite common where a student has not developed the required amount of anticipation needed to apply corrective controls a little before the glider gets into position and is indicative of a student being put onto aerotowing too early in training. The GFA Instructor's manual states *"As a guide, the student should not be handed control on aerotow until competence in smooth and reasonably accurate co-ordination (of aileron, elevator and rudder controls) has been acquired. Additionally, the student should have some idea of ANTICIPATION in the use of the controls, otherwise learning to aerotow will be just that little bit harder".* The GFA Instructor's handbook also recommends the high stages of the aerotow are taught before those near the ground. This is usually from about 800ft AGL and above.

CONCLUSIONS

- The command pilot was appropriately qualified for the flight.
- The aircraft had a valid Maintenance Release and had been maintained in accordance with relevant requirements.
- The aircraft appeared capable of normal operation up to the moment of impact.
- Weather conditions were generally favourable and are not considered to be a factor.
- It is possible the student was allowed on the controls during the aerotow too early in her training and at too low a height.
- The weak-link in the tow rope broke when loads were exceeded during the glider's low-level divergent oscillation behind the towplane.
- For reasons that could not be definitively determined, a straight-ahead landing was not made even though a safe landing was possible.
- During a left-hand turn the glider inadvertently stalled and entered a spin at a height too low for the pilots to recover before ground impact.
- No definite cause could be established for the spin but it was most likely due to mishandling at low airspeed.

Date	5-Apr-2012	Region	GQ	SOAR Report Nbr	S-0167		
Level 1	Operational	Level 2	Aircraft Control	Level 3	Control issues		
A/C Model 1	ASW 20	A/C Model 2					
Injury	Minor	Damage	Minor	Phase	In-Flight	PIC Age	72
An encounter with turbulence, coupled with a flap configuration change, led to uncommanded pitching moments. Despite the harness being secure and tight, the pilot's head contacted the canopy resulting in minor injury. The aircraft was stabilised by deploying the airbrakes and the flight continued without further incident.							

Date	9-Apr-2012	Region	GQ	SOAR Report Nbr	S-0161		
Level 1	Operational	Level 2	Aircraft Control	Level 3	Wheels up landing		
A/C Model 1	Twin Astir	A/C Model 2					
Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	47
Student pilot forgot to configure the aircraft for landing and the Instructor failed to notice. The aircraft landed with the undercarriage retracted. Causal factors include high workload and distraction due to other circuit traffic. A contributing factor was a blown fuse at the battery resulting in the undercarriage warning not activating.							

Date	5-May-2012	Region	GQ	SOAR Report Nbr	S-0162
Level 1	Operational	Level 2	Flight	Level 3	Aircraft preparation

			Preparation/Navigation		
A/C Model 1		Hornet		A/C Model 2	
Injury	Nil	Damage	Nil	Phase	Ground Ops	PIC Age	69
Pilot conducted the Daily Inspection of his aircraft against the maintenance release for another aircraft. The issue highlights a lack of attention to detail and the importance of ensuring that the Maintenance Release is the correct one for the aircraft that is being inspected.					

Date	11-May-2012	Region	GQ	SOAR Report Nbr	S-0164
Level 1	Operational	Level 2	Runway Events	Level 3	Runway incursion
A/C Model 1		HK 36 TC		A/C Model 2	
Injury	Nil	Damage	Nil	Phase	Landing	PIC Age	62
While the glider was on final approach the pilot saw a vehicle towing a glider enter the runway. The glider pilot safely landed to the left of the vehicle. The glider pilot made all appropriate radio calls but the person taxying the other glider was not monitoring the CTAF. Pilots taxying gliders should use a radio to enhance situational awareness and make appropriate calls on the CTAF. Aircraft must not enter a runway while another aircraft is approaching to land.					

Date	19-May-2012	Region	GQ	SOAR Report Nbr	S-0166
Level 1	Airspace	Level 2	Aircraft Separation	Level 3	Near collision
A/C Model 1		Nimbus 2C		A/C Model 2	Discus b
Injury	Nil	Damage	Nil	Phase	In-Flight	PIC Age	52
At 1430 EST on 19 May 2012, while thermalling 30kms west of Dalby Qld and a height of 7,300 ft AMSL, the Discus was joined by the Nimbus. The thermal was averaging about 2 knots. The Nimbus slowed to about 60 knots as he entered the thermal. While the Nimbus pilot retained sight of the Discus at all times, he allowed his aircraft to get within 15 metres of the Discus. The Discus pilot saw the Nimbus approach close but not in time to take avoiding action. The Nimbus Pilot was unfamiliar with his aircraft, having recently acquired a share. The Nimbus pilot was caught out by his aircraft's higher performance and slow rate of roll. This incident highlights the importance of energy management when flying a larger wingspan gliders.					

Date	2-Jun-2012	Region	VSA	SOAR Report Nbr	S-0174
Level 1	Operational	Level 2	Aircraft Control	Level 3	Incorrect configuration
A/C Model 1		Janus B		A/C Model 2	
Injury	Nil	Damage	Nil	Phase	Launch	PIC Age	86
Aircraft took off on aerotow with the airbrakes unlocked. The airbrakes deployed once airborne and went unnoticed during the full tow. The command pilot was distracted prior to launch and failed to complete his pre-takeoff checks.					

Date	3-Jun-2012	Region	NSWGA	SOAR Report Nbr	S-0180
Level 1	Operational	Level 2	Aircraft Control	Level 3	Control issues
A/C Model 1		ASK-21		A/C Model 2	
Injury	Nil	Damage	Nil	Phase	In-Flight	PIC Age	56
A Go Pro digital camera was mounted on the inboard top surface of the port wing, some 10-12 inches from the wing root. This placed the camera in line with the tip of the tailplane. Just after release from aerotow the airframe experienced severe buffeting. The Instructor assumed control and slowed the glider down to 50 knots, at which point the buffeting stopped. The glider was landed without further incident. Investigation revealed vortices from the camera excited the elevator and led to flutter. Attaching cameras must be done					

to CASR Subpart 21.M approved data by an appropriately licenced person.

Date	30-Jun-2012	Region	NSWGA	SOAR Report Nbr	S-0177
Level 1	Consequential Events	Level 2	Low Circuit	Level 3	Low Circuit
A/C Model 1	SZD-50-3 Puchacz	A/C Model 2			
Injury	Nil	Damage	Nil	Phase	Landing	PIC Age	62
The pilot had an overly optimistic view of prospects for ridge lift and did not assess foreseeable risks of increased sink and turbulence in lee of high ground. A late decision to break-off the flight was compounded by heavy sink in the lee of the hills. The pilot persisted too long on downwind leg, despite awareness that he was low, which resulted in a late decision to modify the circuit. A final turn at an unsafe low altitude ensued where there was a very high risk of wingtip impact with ground or skidding turn entry into low level spin. Investigation revealed a number of potential causal factors including optimism error, poor situational awareness and flight management, late break-off decision, launch point and runway fixation, and stress from disruptions to work and personal life.					

Date	3-Jul-2012	Region	SAGA	SOAR Report Nbr	S-0175
Level 1	Operational	Level 2	Fuel Related	Level 3	Exhaustion
A/C Model 1	Grob G 109	A/C Model 2			
Injury	Nil	Damage	Nil	Phase	Ground Ops	PIC Age	71
While taxying the aircraft back to the hangar the engine stopped due to fuel exhaustion. The Daily Inspector misread the calibrations on the dip stick and overstated the fuel level on the fuel card. The dip-stick calibrations were re-marked to make them easier to read. Contributing factor was an unreliable fuel gauge.					

Date	6-Jul-2012	Region	SAGA	SOAR Report Nbr	S-0176
Level 1	Operational	Level 2	Aircraft Control	Level 3	Control issues
A/C Model 1	DG-1000S	A/C Model 2	Piper PA-25-235		
Injury	Nil	Damage	Nil	Phase	Launch	PIC Age	53
Pilot under check became distracted and allowed glider to get out of station behind the tug. A mishandled recovery resulted in the tug pitching forward, at which point the engine misfired and stopped. The tug pilot released the rope and managed to restart the engine in flight. Both aircraft landed safely.					

Date	4-Aug-2012	Region	GQ	SOAR Report Nbr	S-0179
Level 1	Technical	Level 2	Systems	Level 3	Flight controls
A/C Model 1	M 200 Foehn	A/C Model 2			
Injury	Nil	Damage	Nil	Phase	In-Flight	PIC Age	52
During an instructional flight in this side-by-side two-seat trainer the Instructor's rudder pedals (RH side) failed. The student's rudder pedals (LH side) remained affective. The aircraft was successfully landed by the Instructor with the assistance of the student. Subsequent inspection revealed the rod end connecting the right-hand seat rudder pedal to the bell-crank had sheared off. It is thought the fitting may have been defective from manufacture and progressively failing. The substitution of a different bolt sometime in the aircraft history may have also contributed.					

Date	25-Aug-2012	Region	NSWGA	SOAR Report Nbr	S-0181
Level 1	Operational	Level 2	Aircraft Control	Level 3	Hard landing
A/C Model 1	Taifun-17E II	A/C Model 2			

Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	65
Pilot was on first solo on type. While on short finals the pilot moved from the airbrakes to confirm the throttle was closed, at which time the airbrakes opened fully. The pilot closed the airbrakes but failed to maintain a stable approach and landed heavily. Potential causal factors were inexperience on type and high workload.							

Date	25-Aug-2012	Region	NSWGA	SOAR Report Nbr	S-0182
Level 1	Operational	Level 2	Miscellaneous	Level 3	Rope/Rings Airframe Strike
A/C Model 1	ASK-21	A/C Model 2			

Injury	Nil	Damage	Minor	Phase	Launch	PIC Age	74
While attempting the "box" the slipstream, the pilot under instruction allowed a very large bow to develop in the rope. The Instructor took over and stabilised the glider and flew the bow out. The weak-link broke and the rope draped over the glider. The instructor released the rope from the glider and, during its departure, the tow rings hit the leading edge of the tailplane. The Instructor advised that in situations involving a large bow in the rope that the rope be released just before the slack is fully taken up.							

Date	27-Aug-2012	Region	GQ	SOAR Report Nbr	S-0187
Level 1	Operational	Level 2	Aircraft Control	Level 3	Wheels up landing
A/C Model 1	Pik 20B	A/C Model 2			

Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	47
While flying cross country the pilot got low and elected to outland. While on the downwind leg into a paddock the pilot encountered lift and commenced a turn. The glider continued to descend and the decision was made to continue with the landing. The pilot did not complete his pre-landing checks and landed with the undercarriage retracted. Low experience pilot who became distracted by attempting to thermal away while in circuit.							

Date	1-Sep-2012	Region	VSA	SOAR Report Nbr	S-0184
Level 1	Operational	Level 2	Aircraft Control	Level 3	Wheels up landing
A/C Model 1	Twin Astir	A/C Model 2			

Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	59
The undercarriage collapsed on landing. While pre-landing checks were completed and the undercarriage lowered, the pilot did not engage the over-centre lock. Pilot was unfamiliar with type and undercarriage mechanism.							

Date	2-Sep-2012	Region	VSA	SOAR Report Nbr	S-0185
Level 1	Operational	Level 2	Aircraft Control	Level 3	Pilot Induced Oscillations
A/C Model 1	Pilatus B4-PC11	A/C Model 2			

Injury	Nil	Damage	Nil	Phase	Landing	PIC Age	17
During initial climb on the winch launch, the pilot noticed the speed to be slowing and lowered the nose and released. During the straight-ahead landing the glider initially bounced quite severely followed by a series of uncontrollable bounces until the aircraft came to rest. The pilot was inexperienced and mishandled the landing flare.							

Date	9-Sep-2012	Region	GQ	SOAR Report Nbr	S-0190
Level 1	Airspace	Level 2	Aircraft Separation	Level 3	Near collision
A/C Model 1	LS 1-f	A/C Model 2	Pegase 101A		
Injury	Nil	Damage	Nil	Phase	In-Flight	PIC Age	54
On 9 September 2012 at 1215 EST near Warwick Qld, two aircraft flying in separate thermals with overlapping turns came close to colliding. Three gliders were thermalling together when one left in search of better lift. The pilot that left the thermal found a stronger 'core' a short distance away and commenced thermalling. The turns made by the thermalling gliders overlapped and during one turn two of the gliders came close together. Despite radio calls between the two pilots involved in the near miss, neither altered their turns; although the third pilot left because of the collision risk.					

Date	23-Sep-2012	Region	NSWGA	SOAR Report Nbr	S-0188
Level 1	Operational	Level 2	Aircraft Control	Level 3	Pilot Induced Oscillations
A/C Model 1	DG-300 Elan	A/C Model 2			
Injury	Nil	Damage	Substantial	Phase	Landing	PIC Age	41
The pilot made a very flat approach and ballooned during the flare. The glider initially bounced quite severely followed by a series of uncontrollable bounces until the undercarriage collapsed and the aircraft came to rest. The pilot mishandled the landing flare and over-corrected at each bounce.					

Date	25-Sep-2012	Region	SAGA	SOAR Report Nbr	S-0189
Level 1	Operational	Level 2	Aircraft Control	Level 3	Control issues
A/C Model 1	SF 25C Falke	A/C Model 2			
Injury	Nil	Damage	Nil	Phase	Landing	PIC Age	71
The aircraft was being returned to service after a lengthy period due to the engine being replaced. A climb to 1500 ft and circuit were carried out without incident. After a normal landing and as the aircraft was being taxied to the hangar over some rough ground, the aileron control circuit jammed. Inspection revealed the bolt securing the aileron push-rod to the bellcrank had not been secured after maintenance. This incident highlights the importance of the secondary inspections of control circuits upon re-assembly.					

Date	25-Sep-2012	Region	SAGA	SOAR Report Nbr	S-0192
Level 1	Operational	Level 2	Runway Events	Level 3	Runway incursion
A/C Model 1	Grob G 109	A/C Model 2	LS4 Top		
Injury	Nil	Damage	Nil	Phase	Ground Ops	PIC Age	54
Two motor gliders were being prepared for flight behind the runway threshold but within the runway markers. A Beechcraft Baron entered the runway but would not take off until the gliders had been removed. It is a requirements of the Civil Aviation Regulations that aircraft must not take-off while the runway is occupied. This incident highlights the need for glider pilots to only occupy the runway when ready for launch.					

Date	27-Sep-2012	Region	VSA	SOAR Report Nbr	S-0191
Level 1	Operational	Level 2	Flight Preparation/Navigation	Level 3	VFR into IMC
A/C Model 1	SF 25C Falke	A/C Model 2			
Injury	Nil	Damage	Nil	Phase	Launch	PIC Age	70
Pilot self-launched on an early morning wave flight and encountered deteriorating conditions of fog and low					

cloud. Rather than abort the flight and land, the pilot pressed on into IFR conditions for which he was untrained. The aircraft eventually flew into VMC without further incident. This pilot displayed very poor airmanship and was counselled by his CFI.

Date	14-Oct-2012	Region		GQ		SOAR Report Nbr		S-0201	
Level 1	Operational		Level 2	Airframe		Level 3		Doors/Canopies	
A/C Model 1		Duo Discus T				A/C Model 2			
Injury	Nil	Damage		Nil	Phase	Launch		PIC Age	67
Shortly after take-off the canopy began to lift. The pilot held the canopy closed, released from aerotow and landed ahead without further incident. The aircraft was new to the club and the pilot was unfamiliar with the aircraft and the canopy locking mechanism.									

Date	14-Oct-2012	Region		VSA		SOAR Report Nbr		S-0202	
Level 1	Technical		Level 2	Powerplant/Propulsion		Level 3		Engine failure or malfunction	
A/C Model 1		HK-36R				A/C Model 2			
Injury	Minor	Damage		Substantial	Phase	Outlanding		PIC Age	52
The pilot and passenger departed Moorabbin on Saturday October 13th direct to Mansfield and tied down over night. On Sunday morning a 1hr 20 minute local flight was conducted, including about 15 minutes engine-off and an in-flight engine start. Later that day the pilot departed Mansfield for Moorabbin. Weather conditions were good and, after some engine-on touring they approached Healesville. About this time the radio display went blank and it was noticed that the portable GPS unit had been placed over the "Low Voltage" warning light. The electric vario revealed the battery voltage was low at 9.7 volts and the amp meter was reading zero. Attempts to use the radio to receive the Moorabbin ATIS and make contact with the tower were unsuccessful. Contact was made with the Moorabbin tower by mobile phone to advise of the radio and transponder failure and confirm the plan was to return to Moorabbin via Carrum. Shortly afterwards the intercom failed. About three miles south of Carrum, and after receiving approach approval from ATC, the engine began to run rough. The pilot did not perceive the engine was not producing thrust and proceeded with an engine-on approach. At 600 ft AGL it was obvious the airport would not be reached so a paddock was selected to land. When the pilot finally shut down the motor he noted the propeller was fully feathered. The aircraft touched down in a hastily selected paddock and decelerated rapidly due to long grass. The aircraft pitched forward onto its nose and came to rest inverted. The canopy shattered and both occupants exited by the starboard side. The pilot received a minor abrasion but the passenger was uninjured. Contributing factors include: battery not charging due to blown fuse; obscuration of the charge system warning light by the GPS; failure to follow power failure checklist and completely turn off electrics; decision to continue flight with failing power; uncommanded feathering of engine due to low voltage; high workload; and late decision to select an outlanding paddock.									

Date	14-Oct-2012	Region	SAGA	SOAR Report Nbr		S-0203	
Level 1	Operational	Level 2	Runway Events	Level 3		Runway incursion	
A/C Model 1		Nimbus-4DM		A/C Model 2		AS-K 13	
Injury	Nil	Damage	Nil	Phase	Landing	PIC Age	48
A pilot under training in an unfamiliar aircraft flew a low approach and passed close to a glider occupying the runway while its crew were readying it for flight. The landing pilot was attempting to land long to avoid the aircraft on the ground but misjudged the approach due to low sun impeding visibility and unfamiliarity with the aircraft. Contributing factors include a late decision by the ground crew to move the stationary glider off the runway in recognition that landing aircraft have right of way.							

Date	30-Oct-2012	Region	GQ	SOAR Report Nbr	S-0205		
Level 1	Airspace	Level 2	Airspace Infringement	Level 3	Airspace Infringement		
A/C Model 1	LS 1-f	A/C Model 2					
Injury	Nil	Damage	Nil	Phase	In-Flight	PIC Age	52
After returning from a cross-country flight, the pilot inadvertently entered controlled Airspace in the belief that it was uncontrolled at the time. The pilot reported his infringement upon landing.							

Date	30-Oct-2012	Region	GQ	SOAR Report Nbr	S-0206		
Level 1	Airspace	Level 2	Airspace Infringement	Level 3	Airspace Infringement		
A/C Model 1	Ventus-2cM	A/C Model 2					
Injury	Nil	Damage	Nil	Phase	In-Flight	PIC Age	56
The pilot inadvertently entered Oakey controlled airspace while transiting airspace boundaries. Three airspace boundaries in close proximately to airfield are only applicable during midweek operations. The pilot passed through the area before realising his error and reported his infringement upon landing.							

Date	1-Nov-2012	Region	GQ	SOAR Report Nbr	S-0207		
Level 1	Airspace	Level 2	Airspace Infringement	Level 3	Airspace Infringement		
A/C Model 1	LS 7	A/C Model 2					
Injury	Nil	Damage	Nil	Phase	Thermalling	PIC Age	55
A New Zealand pilot inadvertently entered Oakey controlled airspace while climbing in a thermal close to the							

airspace boundary. The pilot eventually realised his error and immediately opened airbrakes to descend below airspace height. The pilot reported his infringement upon landing. The pilot was a visitor to the club and had flown at the site in the previous week. The Club's airfield is within 3NM of the airspace boundary. The pilot was briefed about the correct airspace but for reasons that were not determined he strayed into controlled airspace.

Date	11-Nov-2012	Region	WAGA	SOAR Report Nbr	S-0208
Level 1	Operational	Level 2	Aircraft Control	Level 3	Hard landing
A/C Model 1	Pilatus B4-PC11	A/C Model 2			
Injury	Nil	Damage	Substantial	Phase	Landing	PIC Age	42
On final approach the glider experienced a gust causing the glider to drift off the centreline. The pilot did not maintain adequate speed control and the glider landed heavily. Causal factors include low hours pilot, unstable approach and poor speed control.					

Date	13-Nov-2012	Region	GQ	SOAR Report Nbr	S-0211
Level 1	Operational	Level 2	Aircraft Control	Level 3	Hard landing
A/C Model 1	T61A	A/C Model 2			
Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	21
The pilot was flying the motor glider 'engine off' but with the propeller in a vertical position. Just after touch-down the pilot closed the airbrakes and the glider ballooned into the air. The subsequent application of full airbrake caused the glider to land heavily and the propeller struck the ground resulting in cracking of the fibreglass. Causal factors include low hours, misuse of airbrakes, and recent experience in nose wheel aircraft may have caused the pilot to relax after touch down.					

Date	18-Nov-2012	Region	NSWGA	SOAR Report Nbr	S-0209
Level 1	Operational	Level 2	Aircraft Control	Level 3	Hard landing
A/C Model 1	Hornet	A/C Model 2			
Injury	Nil	Damage	Substantial	Phase	Landing	PIC Age	63
During the ground roll after outlanding, the glider's wing caught in long grass, causing the glider to ground loop. Inspection disclosed cracks radiating round the fuselage behind the wings. The pilot stated that the long grass was not visible from the air.					

Date	29-Nov-2012	Region	NSWGA	SOAR Report Nbr	S-0212
Level 1	Operational	Level 2	Fuel Related	Level 3	Leaking or Venting
A/C Model 1	DG-1000M	A/C Model 2			
Injury	Nil	Damage	Minor	Phase	In-Flight	PIC Age	65
At about 3800ft during launch, the powered sailplane's engine low pressure warning light illuminated. The engine was shut down and allowed to cool and a return to the airfield was initiated. The engine was restarted at 1500ft but the low pressure warning again illuminated and the pilots noticed about 30 litres of fuel had been used since take-off. The engine was immediately shut down and stowed, and the glider landed safely off a straight-in approach. Investigation revealed the single bolt securing the fuel injectors had failed, which allowed fuel from the high pressure pump to escape over the engine and exhaust system in flight while the engine was running.					

Date	30-Nov-2012	Region	WAGA	SOAR Report Nbr	S-0214

Level 1	Operational		Level 2	Aircraft Control		Level 3	Pilot Induced Oscillations
A/C Model 1		ASK-21			A/C Model 2		
Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	47
The low hours pilot landing in strong crosswind flew the aircraft onto the ground at flying speed and nosewheel first. The tail slammed down heavily bursting the rear tyre, and was followed by a series of uncontrollable bounces, nose to tail, until the aircraft came to rest. The pilot mishandled the landing flare due to a strong crosswind component and over-corrected at each bounce.							

Date	5-Dec-2012	Region	GQ		SOAR Report Nbr	S-0213	
Level 1	Operational		Level 2	Terrain Collisions		Level 3	Controlled flight into terrain
A/C Model 1		LS 8-a			A/C Model 2		
Injury	Fatal	Damage	Write-off	Phase	Landing	PIC Age	53

GFA FIELD INVESTIGATION - FACTUAL INFORMATION

On 5 December 2012, at 1739 Eastern Daylight Savings Time, a Rolladen-Schneider LS8A glider was being flown by the registered owner and operator on a cross-country competition flight during the NSW State Championships. The flight was a closed circuit course of three legs flown from Narromine aerodrome totalling a distance of 331kms. Total flight time was 3 hours 22 minutes. When returning to Narromine aerodrome at the completion of the competition task, the glider struck the top of a tree on approach to runway 22 grass right and cart wheeled into the ground suffering serious damage. The pilot was seriously injured and suffered a pattern of multiple injuries consistent with a rapid deceleration. The pattern of injuries rapidly and inevitably led to his death in the ambulance on the way to the hospital. The Australian Transport Safety Bureau was notified shortly after, but declined to investigate. A GFA Field Investigation was undertaken that evening to assist the Police.

Pilot Information

At the time of the accident, the command pilot held an Air Experience Instructor rating and had logged 1,804 hours total time. His last revalidation flight had been satisfactorily completed on 19 August 2012 with Mr Erich Wittstock, the CFI of Warwick Gliding Club.

Aircraft information

The aircraft was maintained by GFA Approved Maintenance Organisation. The last mandatory annual inspection of the aircraft was carried out in January 2012 and a Maintenance Release was issued on 7 January 2012 and remained valid until last light on 6 January 2013. The LS8, like all popular, modern gliders is a high performance glider with excellent handling characteristics. Like most, or perhaps even all, modern, high performance gliders it has a long nose. The LS8 sits a little more nose high than many comparable gliders. The undercarriage retraction lever is on the right hand side and requires the pilot to change hands to operate this lever. If the glider is not trimmed it can tend to drop the nose during this action.

Meteorology

The day was windy with some 25kts at 230 degrees. Thermal strength was good with climbs of up to 7kts. Analysis of the fight log showed mostly good climbs with significant drift and some long glides. Under these wind conditions, there frequently is rollover and pools of heavy sink on approach to runway 22. Evidence is presented that this was the case at the time of the accident.

Accident Site

The Police restricted access to the site on the day of the accident and the GFA Technical Advisor was not allowed entry. The site was visited by the GFA Technical Advisor the following morning, by which time the glider had been removed and some cleaning up had occurred. The accident site was immediately outside the airport boundary fence on the approach to the glider strip, known as '22 grass right'. The threshold of 22 grass right is significantly longer than the usable threshold of the main runway and is some 250m inside the airport boundary fence. The area between the airport boundary fence and the runway proper is stubble and would be regarded as suitable for landing a glider in an emergency. Immediately over the boundary fence and alongside the Warren Road is an irrigation channel, and over the road is a single line of trees estimated to be some 15m high. There is a small section of a single line of trees immediately under the approach to 22 grass right. This line of trees is some 60 m from the aerodrome boundary fence and just over 300m from the runway threshold. Some 30m to the East of the line of trees is a property fence and over that fence is a paddock running across the line of approach to runway 22 that it would be possible to land in. Immediately beyond that is a large circular 'pivot irrigated' paddock. The road and these obstructions and fences run approximately North South and the runway is 220 degrees. The approach is then at an angle of approximately 40 degrees to the fences, road and line of trees. The eastern edge of the road was some 20m from the tree line and the eastern edge of the irrigation channel was some 40 m from the tree line.

The short line of trees (circled) along the eastern side of Warren Road opposite the threshold of 22 grass right with which the glider collided.

Impact Details

The glider collided with trees on approach to runway 22 with its left wing, some 12 to 16 metres above the ground. The glider cartwheeled to the left and impacted a grass verge before the road with its right wingtip. The glider then slid across the road in the direction of approach and impacted with the ground on a small embankment beside the irrigation channel. The glider came to rest pointing somewhat back along the approach path at about 45 degrees to the approach direction. The cockpit area was severely damaged. The wing spar was still intact and both wings were still joined. The attachment of the wings to the fuselage had been damaged and the wing was twisted, left wing (port) forward, so that the inboard leading edge had been pushed into the cockpit area. The left (port) wing had two clear impact sites where the glider had struck the two subsidiary tree trunks. The fact that the wing was twisted left (port) forward indicated that the last force exerted on the wing was with the ground as impact with the tree would have twisted it left (port) wing back (if anything). The right wing was mostly intact but was split along the leading edge. The airbrakes on both sides were out and the right hand brake had been distorted upwards, suggesting that the airbrakes were deployed prior to impact. The tail boom was broken behind the cockpit (and the wings) and was lying to the left (port). The undercarriage was down.

Flight data recorder

The glider carried a GPS based traffic and collision-warning system (FLARM) and GPS based Cambridge flight logger, both of which was capable of logging the flight path and altitude. A logger trace was obtained as a sealed IGC file from both the FLARM and the Cambridge logger and provided to the police. Both traces were examined in detail and, while intact, the FLARM trace appeared to cease some 600m from the point of impact and the Cambridge trace appeared to cease some 180 from the point of impact. This is most likely due to both loggers recording data at different time intervals. The Cambridge logger pressure altitude showed heights which were below ground at the end of the flight and the trace over the last 2 kms or so, had 'flat lined' and contained no information. With this exception both traces showed both pressure and GPS altitude and indicated airspeed based on the wind at the last thermal. This wind was adequately constant over the flight at about 25 kts. Overall, both traces show a flight with good climbs of up to 7 kts and a final glide from about 6,000' starting just beyond the river flowing diagonally across the plane between Tottenham and Trangie (the Bogan River) with some 70-80 kms to run. The final glide was made at about 100 kts and, while the pilot looked at a number of indications of lift, no more than a couple of turns were taken to gain further height. The glide seemed to start below the height required to finish, however, an energy line was contacted at about 4,500' which allowed a glide of some 40 to 50 kms with no overall loss of height. The pilot went about 20 kms down wind and turned at about 4,000' with sufficient height to finish without further lift. The trace shows the glider passing over the finish line, lined up with glider runway 18 at 2.5 kms (finish line distance) from the airfield. The pilot then turned smoothly left and executed a smooth curving path to line up conveniently on runway 22 grass right; the preferred active runway which was directly into wind. The wind was about 25 knts at 230o making runway 22 almost directly into wind. The traces were examined and the data for height and speed taken from a point by point analysis of both traces over the finish period. The FLARM trace included both pressure altitude and the GPS altitude as both AMSL (Above Mean Sea level) as well as an estimate of the altitude AGL (Above Ground Level – above the aerodrome height.) As previously mentioned, the pressure altitude from the Cambridge logger trace was not usable but the Cambridge trace has GPS altitude. GPS altitude is not as accurate as pressure altitude in absolute terms. However, as the errors are systematic, GPS altitude differences are sufficiently accurate for

these purposes. The FLARM trace was used to attempt to determine an aerodrome altitude which makes all traces consistent. These chosen aerodrome altitudes are shown in the tables. A trace for the glider flown by a witness who landed some minutes after the accident also showed an aerodrome elevation similar to that assumed in the analysis. Based on these aerodrome elevations, both traces then show that the finish met expected standards. The glider finished between 500 to 600 ft AGL about 2.5kms from the airfield reference point; with the glider flying at a speed of about 100 kts. At these heights, the pilot would be very unlikely to continue to fly at 90 to 100 kts and it is considered he was slowing down prior to the collision with the tree. The Cambridge trace shows that the pilot had little more than about a minute to run from finish to threshold and this is the time available to plan landing options. The trace nearer the airfield suggests that the glider, finally, had no more than sufficient energy to make a short, but very adequate approach to the planned runway 22 grass right. Whether this was energy management by the pilot (using air brakes to dump additional height) or that the glider had just sufficient energy given circumstances cannot be determined from the trace. Comparison of the trace and satellite imagery shows that the FLARM trace appeared to finish some 600 m from the point of impact and the Cambridge trace some 180 m from the point of impact. Neither trace appeared to show a point near the ground to allow impact with a tree some 15 m high. The Cambridge trace shows a decreasing altitude and speed as the glider approached the point of impact (last point some 180 m from the point of impact.) This could indicate either sink, or the use of brakes to control the energy, to make a short field landing or both. At no time was the glider flown too slowly (even given the wind) nor did it appear that the glider could not reach the field. Both traces end abruptly indicating probable loss of electrical power. The battery was found badly damaged and outside the cockpit at the final point of contact – so no point could have been obtained on the ground after impact.

Medical information

The command pilot's last medical declaration was dated 29 September 2012, in which he declared that he was not suffering from any physical condition that would preclude him from operating a glider as pilot in command. The declaration also included an undertaking that in the event of him contracting any physical condition precluding him from operating a glider as pilot in command, that he would cease flying in that capacity while the condition makes it unsafe for him to do so. Witnesses reported that the pilot was conscious when they reached the accident site and was responsive to commands. The Pathologist's report did not identify any existing preconditions for incapacitation. The post-mortem examination did not identify any disease or indicators of likely physiological impairment, and no alcohol or drugs were identified in the toxicological analysis.

Characteristics of Straight-in Approaches

- Used to simplify the approach under competition conditions.
- Requires more experience and energy management but avoids complexity and exposure to collision risk.
- Care needs to be taken to ensure that the pre-landing check – FUST (Flaps, undercarriage speed and trim) – is carried out.
- The absence of a base leg (particularly) but also of a downwind reduces the opportunity to examine the landing area and final approach.
- The normal procedure is to avoid a pull up after finish as this pull up can create a collision risk. The approach to the field is then often made at higher speed and a lower approach angle which reduces visibility of the approaches and landing field and it shortens the time available to asses and choose landing run options. This is especially significant at higher traffic levels.
- For experienced pilots, none of this does more than add to workload and this procedure is, on balance, safer for experienced pilots.These procedures can legitimately be compared to the common practice of allowing straight in approaches to more capable powered aircraft at untowered airfields and is safer for the same reasons. Like many altered procedures, the change changes the nature of the hazards encountered. In this case the hazards change from those resulting from complexity and collision risk, to workload and energy management and judgement. Overall, both in Australia and internationally, it is considered that, for experienced pilots under

competition conditions, straight in approaches are safer than doing a circuit. There are no 'no risk' procedures.

Forward Visibility

The last data points show the glider slowing and descending. It is of interest to determine what it is possible to see over the nose direct ahead. Forward visibility depends on nose attitude. The lower the nose the better the forward visibility. Without extensive experimentation at speeds shown by the data logger trace the forward visibility would be limited to an estimated 12 degrees down from horizontal. At about 200m from an obstacle the limit of visibility would be about 40m, or some 130ft, below the nose. At the time of the last data point on the Cambridge trace, it seems likely, but not certain that the pilot would have had a line of sight to see the top of the tree.

ANALYSIS

The data logger traces both show that the flight appeared well managed with good climbs and no significant low points. Lowest height before final glide was 4,500'. Duration about 3 hours. The trace confirms the strong winds but these do not seem to have affected the flight or created significant difficulty. The final glide was set some 70 – 80 kms from the finish and was executed at ca 100 knts and, while the pilot investigated some areas of potential lift and used an effective energy line for some 40 kms or more, no additional climb was required to reach the finish at an acceptable height and speed. The task was an assigned area task, which allows the pilot to vary the specific task flown within limits imposed by the 'assigned areas' and, specifically, in this instance, allowed the pilot to fly north of Mungeribar a distance chosen by the pilot and then return to the finish line at Narromine airfield. The pilot did just that, and turned into wind north of Mungeribar to return to Narromine with sufficient height to reach a safe finish. The glider reached the finish circle at Narromine (2.5 kms radius) at about 500 - 600' AGL and 100 knts aligned with the glider RWY 18 . The pilot altered course smoothly to align with the preferred runway, 22 grass right, and, without any significant pull up, continued at about 100 – 90 knts to approach 22 grass right. The pilot made appropriate calls and may have asked for some obstructions to be removed from the runway. To this point the flight looked routine and well managed. And there was no evidence of tiredness, stress or partial incapacity at any time. The physical evidence combined with witness reports shows that, over the last few points in the data logger trace, the glider was slowing and descending at an increasing rate and that at a point some 300 m from the threshold, and beyond the last data point, the glider flew into a tree some 50 ft or so high, wings level, and with no apparent attempt to pull up to avoid that tree. And the glider cartwheeled violently into the ground.

This recorded behaviour of the glider over the last few data points is consistent only with, either, sudden, heavy sink, or the deliberate application of the air brakes to set up a descent. These last points were just prior to the accident site – by some 150 – 200 m – that is, some 500 m from the threshold. The trace shows that the last recorded speed was ca 85 knots and this suggests, but does not prove beyond doubt, that the glider would have had sufficient energy to pull up over the tree. If this was prevented by unexpected sink, vigorous enough to be beyond the energy the glider had left to control the descent, then the pilot did the best he could and resisted the temptation to raise the nose and slow too much, as this would have made penetration into wind worse. The presence of significant sink on this approach is common and well known, and a pilot making much the same approach on this day within minutes of the accident, reported experiencing this on that day, however the line of trees do not seem adequate to produce an effect severe enough to cause this outcome. Further, unless the sink causing this outcomes was very abrupt, the glider had only to modify course a little to avoid the line of trees. Finally, the only witness to see the glider more than seconds away from impact was certain the brakes were out. Also, the fact that the wing and spar was essentially intact, damage to control rods inside the wings is unlikely, if not impossible. As the locking mechanism is in the wings in this glider in the absence of breakage of the control rods, the fact that the breaks were out after impact establishes that the brakes were unlocked (and hence deployed by the pilot) before impact. If a pilot was concerned that the glider would not reach the threshold, the very first thing the pilot would do would be to close the brakes. Accordingly, it is essentially unlikely that the glider ran into sink sufficient to cause the glider to impact the tree. If this conclusion is accepted then, the absence of any avoiding actions suggests strongly that the pilot did not see the tree until too late. Again, in the absence of an alternate explanation, it must be concluded that this accident falls into a category – which is all too frequent throughout all segments of aviation for different reasons, and is often without clear cause – referred to as Control Flight Into Terrain, or CFIT. A likely contributor in this case is work load and tunnel vision. The condition of overload is well known and as this condition is approached the brain can focus on the issues relevant to the approaching overload and can ignore, as though not present, visual input which is obvious and vital. The pilot may simply not have seen the tree in front of him. At a distance corresponding to a normal final there is evidence that the pilot was still deciding on landing options, and the pilot was observed to manoeuvre in both directions, and then return to the direct approach initially selected. It is conceivable that, while the pilot was considering alternate landing runs, the pilot did not see the line of trees because he was focussing on these decisions and was looking effectively over the top of the line of trees. Having decided that the best landing option was a short field landing direct ahead, the pilot may have been too close to the line of trees to see them, or at least for them to be obvious, under the nose. The pilot then may have pulled the brakes out and commenced a descent preparatory to a short field landing and then did not have time to respond to avoid the tree. There remains the question – why did the pilot initiate action to set up a short field landing so early – 300 m from the threshold? These decisions depend on angle judgement. Experience shows that that angle judgement at very flat angles is difficult. There have been a number of similarly inexplicable accidents where a pilot, under higher workload and/or dehydration or low blood sugar has set up at an unacceptably flat angle to the runway on landing, become accustomed to that angle and persisted until the glider is about to fly into the ground. An alternate explanation is also possible. The changed procedure of a straight in approach removes the 'normal' trigger for the pre landing check (FUST). If the pilot remembered that the wheel was not out after opening the air brakes the instinctive reaction would be to deploy the wheel,. This would require the pilot to let go of the stick with the right hand. The left hand would be holding the brakes. If the FUST check was not done the glider would be trimmed for higher a speed and would immediately pitch nose down. If this occurred just over or before the tree there may not have been time for the pilot to respond and avoid the tree.
Which of these scenarios is correct may well never be determined, but, in the absence of any alternate explanation, it seems inevitable that the basic outcome was as described.

CONCLUSIONS

1. The command pilot was appropriately qualified for the flight.
2. The aircraft had a valid Maintenance Release and had been maintained in accordance with relevant requirements.

3. The aircraft appeared capable of normal operation up to the moment of impact.
4. Weather conditions were turbulent close to the ground and may have been a factor.
5. It is possible the pilot was deliberately flying at low level to land short and close to his vehicle.
6. It is possible that the pilot experienced cognitive tunnelling and did not recognise the trees as a hazard.

Date	15-Dec-2012	Region	WAGA	SOAR Report Nbr		S-0215	
Level 1	Operational	Level 2	Aircraft Control	Level 3		Wheels up landing	
A/C Model 1		Astir CS		A/C Model 2			
Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	59
The low hours pilot entered circuit high on a long downwind leg and completed his pre-landing checks early. Another glider joined downwind ahead, so the pilot broke off his circuit, retracted the undercarriage and flew a circle before rejoining downwind. The pilot did not lower the undercarriage and this was not picked up as a further pre-landing check was not undertaken. The glider landed with the undercarriage retracted. Causal factors include pilot inexperience and distraction by other aircraft.							

Date	16-Dec-2012	Region	WAGA	SOAR Report Nbr		S-0216	
Level 1	Operational	Level 2	Airframe	Level 3		Objects falling from aircraft	
A/C Model 1		Piper PA-25-235		A/C Model 2			
Injury	Nil	Damage	Minor	Phase	Launch	PIC Age	66
At approximately 1400 feet agl, the glider pilot under tow reported something falling off the tug from the port side into open country. On landing, it was found that the port exhaust stub had failed at the weld where it joined the main exhaust system level with the cowl and had departed the aircraft. No indication of cracking was found at the daily inspection.							

Date	23-Dec-2012	Region	VSA	SOAR Report Nbr		S-0217	
Level 1	Operational	Level 2	Miscellaneous	Level 3		Rope/Rings Airframe Strike	
A/C Model 1		Nimbus 2		A/C Model 2	AMERICAN CHAMPION AIRCRAFT CORP 8GCBC		
Injury	Nil	Damage	Minor	Phase	Launch	PIC Age	70
Shortly after launch and at about 500ft AGL, the aerotow rope prematurely released from the tug. The towrope wrapped itself around the undercarriage doors and fuselage causing damage to the pitot tube. Both aircraft made a successful landing on the aerodrome. The reason for the premature release was not determined.							

Date	23-Dec-2012	Region	VSA	SOAR Report Nbr		S-0226	
Level 1	Operational	Level 2	Terrain Collisions	Level 3		Controlled flight into terrain	
A/C Model 1		ASW20C		A/C Model 2			
Injury	Serious	Damage	Write-off	Phase	Landing	PIC Age	40
The glider released from tow at 1,800ft AGL and was seen to commence a thermalling turn. Shortly afterwards the glider was seen on downwind leg for runway 36 while the tug was positioned on base for landing. The glider pilot communicated with the tow pilot asking that the tow pilot expedite the landing. The glider was seen to fly too far downwind for the conditions. While over a landable paddock on final approach							

some 1,000 metres from the runway the glider pilot considered that he was too high and deployed airbrakes but heavy sink was encountered resulting in him closing the airbrakes. The pilot dived towards the ground in an effort to turn height into speed with the aim of converting the speed back into height to clear the trees ahead of him on the landing approach. The right wing on the glider impacted the tree in the middle of the paddock he was overflying causing the aircraft to slew sideways to the right. The left wing took the initial impact with the ground followed by the fuselage. The aircraft was substantially damaged and the pilot seriously injured.

Potential causal factors include: the pilot's pre-occupation with maintaining separation from the tow plane ahead of the glider; flying too far downwind of the operational runway; experiencing heavy sink on final approach; application of the theory of converting height into speed in an effort to pull up over obstacles; and cognitive tunnelling or 'tunnel vision' under stress resulting in the pilot not perceiving the tree he collided with as a threat).

Date	29-Dec-2012	Region	VSA	SOAR Report Nbr	S-0219		
Level 1	Operational	Level 2	Aircraft Control	Level 3	Hard landing		
A/C Model 1	Astir CS 77	A/C Model 2					
Injury	Nil	Damage	Substantial	Phase	Landing	PIC Age	19
The pilot embarked on a cross-country flight on a difficult day and allowed himself to get low in an area with limited outlanding options. The pilot's paddock selection was left too late, and he landed in a field containing irrigation pipes. The aircraft ground-looped on landing resulting in serious damage to the airframe. The pilot was uninjured. This incident highlights the importance of not getting out of reach of landable terrain, and to make paddock selection early with alternative landing options available if the first paddock is found to be unacceptable.							

Date	30-Dec-2012	Region	WAGA	SOAR Report Nbr	S-0220
Level 1	Operational	Level 2	Airframe	Level 3	Landing gear/Indication
A/C Model 1	Standard Cirrus	A/C Model 2			

Injury	Nil	Damage	Minor	Phase	Landing	PIC Age	43
When the pilot attempted to put the undercarriage down the lever handle broke off, resulting in the undercarriage not locking down on landing. Inspection revealed fatigue cracking at the welded join.							

Level 1	Level 2	Level 3	Definition
Airspace	Aircraft Separation	Collision	An aircraft collides with another aircraft either airborne or on the runway strip, or a vehicle or person on the runway strip.
Airspace	Aircraft Separation	Issues	Airspace - Aircraft separation occurrences not specifically covered elsewhere.
Airspace	Aircraft Separation	Near collision	An aircraft comes into such close proximity with another aircraft either airborne or on the runway strip, or a vehicle or person on the runway strip, where immediate evasive action was required or should have been taken. (a) En-route (b) Thermalling (c) Circuit
Airspace	Airspace Infringement	Airspace Infringement	Where there is an unauthorised entry of an aircraft into airspace for which a clearance is required.
Airspace	Other	Other Airspace Events	Airspace occurrences not specifically covered elsewhere.
Consequential Events	Ditching	Ditching	When an aircraft is forced to land on water.
Consequential Events	Diversion / Return	Diversion / Return	When an aircraft does not continue to its intended destination, but either returns to the departure aerodrome or lands at an alternative aerodrome.
Consequential Events	Emergency / Precautionary descent	Emergency / Precautionary descent	**Emergency descent** - Circumstances that require the flight crew to initiate an immediate high rate descent to ensure the continued safety of the aircraft and its occupants.
Consequential Events	Emergency evacuation	Emergency evacuation	When crew and/or passengers vacate an aircraft in situations other than normal and usually under the direction of the operational crew.
Consequential Events	Forced / Precautionary landing	Forced / Precautionary landing	**Forced landing** – Circumstances under which an aircraft can no longer sustain normal flight and must land regardless of the terrain. **Precautionary landing** - A landing made as a precaution when, in the judgement of flight crew, a hazard exists with continued flight.
Consequential Events	Low Circuit	Low Circuit	Any occasion where a pilot flies a Low Circuit that was potentially hazardous.
Consequential Events	Other	Other Consequential Events	Consequential events not specifically covered elsewhere.
Environment	Weather	Icing	Any icing issue that affects the performance of an aircraft.
Environment	Weather	Lightning strike	The aircraft is struck by lightning.
Environment	Weather	Other Weather Events	Weather occurrences not specifically covered elsewhere.
Environment	Weather	Turbulence/Windshear/Microburst	Aircraft performance and/or characteristics are affected by turbulence, windshear or a microburst.
Environment	Weather	Unforecast weather	Operations affected by weather conditions that were not forecast or not considered by the flight crew.
Environment	Wildlife	Animal strike	A collision between an aircraft and an animal.
Environment	Wildlife	Birdstrike	A collision between an aircraft and a bird.
Environment	Wildlife	Other Wildlife Events	Wildlife related occurrences not specifically covered elsewhere.
Operational	Aircraft Control	Airframe overspeed	The airspeed limit has been exceeded for the current aircraft configuration as published in the aircraft manual.
Operational	Aircraft Control	Control issues	The flight crew encounter minor aircraft control difficulties while airborne or on the ground.
Operational	Aircraft Control	Hard landing	Damage occurs during the landing.
Operational	Aircraft Control	Incorrect configuration	An aircraft system is incorrectly set for the current and/or intended phase of flight.
Operational	Aircraft Control	In-flight break-up	The aircraft sustained an airborne structural failure or damage to the airframe, to the extent that continued flight is no longer possible.
Operational	Aircraft Control	Loss of control	When control of the aircraft is lost or there are significant difficulties controlling the aircraft either airborne or on the ground.
Operational	Aircraft Control	Other Control Issues	Aircraft control occurrences not specifically covered elsewhere.
Operational	Aircraft Control	Pilot Induced Oscillations	Any PIO occurrence occassioning damage.
Operational	Aircraft Control	Stall warnings	Any cockpit warning or alert that indicates the aircraft is approaching an aerodynamic stall.
Operational	Aircraft Control	Wheels up landing	An aircraft contacts the intended landing area with the landing gear retracted.

Operational	Aircraft Loading	Loading related	The incorrect loading of an aircraft that has the potential to adversely affect any of the following: a) the aircraft's weight; b) the aircraft's balance; c) the aircraft's structural integrity; d) the aircraft's performance; e) the aircraft's flight characteristics.
Operational	Aircraft Loading	Other Loading Issues	Aircraft loading occurrences not specifically covered elsewhere.
Operational	Airframe	Doors/Canopies	When a door or canopy, or its component parts, has failed or exhibited damage.
Operational	Airframe	Furnishings & fittings	An internal aircraft furnishing or fitting, including its component parts, has failed or exhibited damage.
Operational	Airframe	Fuselage/Wings/Empennage	Damage to the fuselage, wings, or empennage not caused through collision or ground contact.
Operational	Airframe	Landing gear/Indication	When the landing gear or its component parts (including indications), has failed or exhibited damage.
Operational	Airframe	Objects falling from aircraft	Objects inadvertently falling from or detaching from an aircraft.
Operational	Airframe	Other Airframe Issues	Technical - Airframe occurrences not specifically covered elsewhere.
Operational	Airframe	Windows	A window or a component part has failed or exhibited damage.
Operational	Communications	Other Communications Issues	Communications occurrences not specifically covered elsewhere.
Operational	Communications	Transponder related	The incorrect setting of a code and/or usage of transponder equipment.
Operational	Crew and Cabin Safety	Cabin injuries	A cabin crew member or passenger has suffered an illness or injury.
Operational	Crew and Cabin Safety	Flight crew incapacitation	A Flight Crew member is restricted to nil or limited duties as a result of illness or injury.
Operational	Crew and Cabin Safety	Inter-crew communications	Relates specifically to a loss, or breakdown, of communication between flight crew or associated ground staff.
Operational	Crew and Cabin Safety	Other Crew and Cabin Safety Issues	Cabin safety occurrences not specifically covered elsewhere.
Operational	Crew and Cabin Safety	Passenger related	Where the actions of a passenger adversely or potentially affects the safety of the aircraft.
Operational	Crew and Cabin Safety	Unrestrained objects	When objects are not appropriately restrained for the aircraft operation or phase of flight.
Operational	Fire Fumes and Smoke	Fire	Any fire that has been detected and confirmed in relation to an aircraft operation.
Operational	Fire Fumes and Smoke	Fumes	When abnormal fumes or smells are reported on board the aircraft.
Operational	Fire Fumes and Smoke	Smoke	When smoke is reported to be emanating from: a) inside the aircraft; or b) an external component of the aircraft.
Operational	Flight Preparation/Navigation	Aircraft preparation	Errors or omissions during the planning and/or pre-flight phase that affect or may affect aircraft safety in relation to: a) the aircraft's weight; b) the aircraft's balance; c) the aircraft's structural integrity; d) the aircraft's performance; e) the aircraft's flight characteristics.
Operational	Flight Preparation/Navigation	Lost / Unsure of position	When flight crew are uncertain of the aircraft's position and/or request assistance from an external source.
Operational	Flight Preparation/Navigation	Other Flight Preparation/Navigation Issues	Navigation - Flight planning occurrences not specifically covered elsewhere.
Operational	Flight Preparation/Navigation	VFR into IMC	An aircraft operating under the Visual Flight Rules enters Instrument Meteorological Conditions.
Operational	Fuel Related	Contamination	When the presence of a foreign substance is found in fuel.
Operational	Fuel Related	Exhaustion	When the aircraft has become completely devoid of useable fuel.
Operational	Fuel Related	Leaking or Venting	Relates specifically to the unplanned loss of fuel from a fuel tank or fuel system.
Operational	Fuel Related	Low fuel	The aircraft's supply of fuel becoming so low (whether or not the result of a technical issue) that the safety of the aircraft is compromised.
Operational	Fuel Related	Other Fuel Related Issues	Fuel related occurrences not specifically covered elsewhere.

Operational	Fuel Related	Starvation	When the fuel supply to the engine(s) is interrupted, but there is still usable fuel on board the aircraft.
Operational	Ground Operations	Foreign Object Damage/Debris	Any loose objects on an aerodrome have caused, or have the potential to cause, damage to an aircraft.
Operational	Ground Operations	Ground handling	Any ground handling and aircraft servicing that caused, or has the potential to cause injury or damage to a stationary aircraft.
Operational	Ground Operations	Jet blast/Prop/Rotor wash	Any air disturbance from a ground-running aircraft propeller, rotor or jet engine that has caused, or has the potential to cause, injury or damage to property.
Operational	Ground Operations	Other Ground Ops Issues	Ground operation occurrences not specifically covered elsewhere.
Operational	Ground Operations	Taxiing collision/near collision	An aircraft collides, or has a near collision, with another aircraft, terrain, person or object on the ground or on water during taxi.
Operational	Miscellaneous	Missing aircraft	The aircraft is reported as missing.
Operational	Miscellaneous	Other Miscellaneous	Miscellaneous occurrences not specifically covered elsewhere in this manual.
Operational	Miscellaneous	Rope break/Weak link failure	Towplane separation incident necessitating a modified circuit.
Operational	Miscellaneous	Rope/Rings airframe strike	Airframe struck by launch cable or rings. Includes entanglemt with rope.
Operational	Miscellaneous	Warning devices	Situations in which an aural or visual aircraft warning device activates to alert the flight crew to a situation requiring immediate or prompt corrective action.
Operational	Miscellaneous	Winch Performance Issue	Any incident caused by poor winch performance, such as power failure, or mechanical reasosn.
Operational	Runway Events	Depart/App/Land wrong runway	An aircraft that: a) takes off b) lands, c) attempts to land from final approach d) operates in the circuit at, to or from an area other than that authorised or intended for landing or departure
Operational	Runway Events	Other Runway Events	Runway event occurrences not specifically covered elsewhere.
Operational	Runway Events	Runway excursion	An aircraft that veers off the side of the runway or overruns the runway threshold.
Operational	Runway Events	Runway incursion	The incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.
Operational	Runway Events	Runway undershoot	Any aircraft attempting a landing and touches down prior to the threshold.
Operational	Terrain Collisions	Collision with terrain	Any collision between an airborne aircraft and the ground, water or an object, where the flight crew were aware of the terrain prior to the collision.
Operational	Terrain Collisions	Controlled flight into terrain (CFIT)	When a serviceable aircraft, under flight crew control, is inadvertently flown into terrain, obstacles or water without either sufficient or timely awareness by the flight crew to prevent the collision.
Operational	Terrain Collisions	Ground strike	When part of the aircraft drags on, or strikes, the ground or water.
Operational	Terrain Collisions	Wirestrike	When an aircraft strikes a wire, such as a powerline, telephone wire, or guy wire, during normal operations.
Technical	Powerplant/Propulsion	Abnormal Engine Indications	A visual or cockpit warning that indicates an engine is malfunctioning or operating outside normal parameters.
Technical	Powerplant/Propulsion	Engine failure or malfunction	An engine malfunction that results in a total engine failure, a loss of engine power or is rough running.
Technical	Powerplant/Propulsion	Other Powerplant/Propulsion Issues	Powerplant / Propulsion occurrences not specifically covered elsewhere.
Technical	Powerplant/Propulsion	Propeller malfunction	The failure or malfunction of an aircraft propeller or its associated components.
Technical	Powerplant/Propulsion	Transmission & Gearboxes	The failure or malfunction of an aircraft transmission/gearbox and/or its associated components.

Technical	Systems	Avionics/Flight instruments	The partial or complete loss of normal functioning of the avionics system or its components.
Technical	Systems	Electrical	The partial or complete loss of normal functioning of the aircraft electrical system.
Technical	Systems	Flight controls	The partial or complete loss of normal functioning of a primary or secondary flight control system.
Technical	Systems	Fuel	The partial or complete loss of normal functioning of the fuel system.
Technical	Systems	Hydraulic	The partial or complete loss of the hydraulic system.
Technical	Systems	Other Systems Issues	Technical - Systems occurrences not specifically covered elsewhere.