Air Accident Investigation Unit Ireland

SYNOPTIC REPORT

ACCIDENT

Quik GT450 Microlight, G-GTEE
Near Convoy, Co Donegal
30 September 2012

An Roinn Iompair
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13[1] to the Convention on International Civil Aviation, Regulation (EU) No 996/2010[2] and Statutory Instrument No. 460 of 2009[3], safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

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[1] **Annex 13**: International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.

[2] **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.

[3] **Statutory Instrument (SI) No. 460 of 2009**: Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.

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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI 460 of 2009, the Chief Inspector of Air Accidents on 30 September 2012, appointed Mr Thomas Moloney as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Report.

Aircraft Type and Registration:	**P & M Aviation Ltd Quik GT450, G-GTEE**	
No. and Type of Engines:	**1 x Rotax 912 ULS**	
Aircraft Serial Number:	**8256**	
Year of Manufacture:	**2007**	
Date and Time (UTC[4]):	**30 September 2012 @ 12.40 hrs approximately**	
Location:	**Near Convoy, Co Donegal, Ireland** **N54° 50.567', W007° 39.627'**	
Type of Operation:	**General Aviation**	
Persons on Board:	**Crew - 1**	**Passengers - Nil**
Injuries:	**Crew - 1**	**Passengers - Nil**
Nature of Damage:	**Aircraft destroyed**	
Commander's Licence:	**NPPL(A)[5] issued by UK Civil Aviation Authority (CAA)**	
Commander's Details:	**Male, aged 32 years**	
Commander's Flying Experience:	**341 hours, of which 75 were on type**	
Notification Source:	**Fire Service, Castlebar, Co Mayo**	
Information Source:	**AAIU Field Investigation** **AAIU Report Form submitted by Commander**	

[4] **UTC:** Co-ordinated Universal Time. All times in the Report are UTC unless stated. Add one hour for local time.
[5] **NPPL(A):** National Private Pilot's Licence (Aeroplanes).

SYNOPSIS

The microlight aircraft was making an approach to land at Carrickbrack airfield near Convoy in Co Donegal following a local flight from Letterkenny. The weather conditions at the time were blustery with southwesterly winds gusting to 25-30 kts at ground level. At a height of approximately 300 to 350 feet, the sail of the microlight failed without warning. The microlight descended rapidly and impacted a wet agricultural field. The Pilot, who was the sole occupant, sustained serious injuries. The microlight was destroyed.

1. FACTUAL INFORMATION

1.1 History of the Flight

The Pilot reported to the Investigation that he had departed from a private airstrip near Buncrana, Co Donegal at approximately 11.00 hrs on 30 September 2012. He flew in the vicinity of the Inishowen Peninsula and Inch Island for a short period before routing to Stevenson's Airfield near Letterkenny. He stated that he landed there at approximately 11.45 hrs. He went into the resident aero club premises where he had a cup of tea. He stated that he departed at approximately 12.20 hrs with the intended destination of Carrickbrack airfield near Convoy, Co Donegal.

He reported that, while the wind was gusty and the windsock was "*up*" at Carrickbrack, he felt that that he would have no problems landing there. He flew downwind past the airfield and then made a right hand turn back into wind with the intention of landing on Runway (RWY) 26. Just after he had turned onto finals with the wings levelled, he heard what he described as a *"ping bang"* noise from what he thought was his left side. This occurred at a height of about 350 ft above the ground. He stated that he then "*lost all control of the* [control] *bar*" and that "*there was no weight to the wing in the bar then*".

The Pilot recalled that the microlight went into a fast spiral descent, although he could not say whether it was to the right or the left. As the microlight descended, he found that he was able to "*get a bit of flight*" when he pushed the control bar out to the right. He thought that in the last few seconds of the descent he pushed the control bar fully out to the right and, together with full throttle being selected, he felt that this lifted the nose a little just before impact with the ground. He stated that this caused the aircraft to "*bounce in*" rather than "*hitting straight in"* to the ground.

The Pilot was wearing a lap strap but not the installed shoulder strap during the flight. The lap strap restrained him in the pod. He recalled that he took off his helmet, opened the lap strap and crawled out of the wreckage.

The microlight impacted heavily in an agricultural field. The accident was witnessed by several local people and assistance arrived on the scene within a few minutes of the impact. The emergency services arrived within approximately 20 minutes and the Pilot, who had sustained serious injuries, was subsequently transferred to Letterkenny Hospital by an Irish Coast Guard helicopter.

1.1.1 Interviews with Witnesses

The Investigation interviewed several persons who either witnessed the accident or who had observed the microlight earlier on the day of the accident.

Witness A, an experienced microlight pilot, was on the ground at his own airfield adjacent to Carrickbrack. He told the Investigation that when he first saw G-GTEE it was flying downwind at about 300 ft over his airfield. He said that, about 10 seconds later, it turned into wind and that it appeared to him to be at full power. The microlight then made what seemed to be a near vertical descent to the ground. He heard a loud thud on impact. He immediately phoned 999 for the emergency services and he arranged to meet them in Convoy village and to bring them from there to the accident site. He said that it took approximately 15 minutes for the emergency services to arrive in Convoy and a further five minutes to get to the site. A person who had arrived first at the accident site told Witness A that when he got there, the microlight was on its side and the Pilot had partially exited the craft.

Witness A said that, at the time of the accident, there was a blustery westerly wind gusting to 25 kts. He described the conditions as difficult. He knew the Pilot, who he said was a regular visitor to the airfields around Convoy and who would have been very familiar with the area.

Witness B and Witness C told the Investigation that they had seen the Pilot when he made his intermediate stop in Letterkenny. They described the weather conditions as challenging for microlight flying with winds gusting from 22 to 24 kts when G-GTEE departed at around 12.20 hrs.

1.1.2 Interview with the Pilot

The Investigation interviewed the Pilot some weeks after the accident, following his discharge from hospital. He stated that he had commenced microlight training in Northern Ireland in 2008 and that he had done the majority of his training on his own Pegasus Quantum 15 microlight from a private site near Buncrana, Co Donegal. He was issued with his NPPL(A) in June 2010. The Investigation asked if he had considered applying for an Irish licence and he responded that, as he was resident in Northern Ireland, he did not consider that he required one. He said that the NPPL(A) showed an address in Co Donegal because that was where he was resident at the time it was issued. He confirmed that G-GTEE was based at a private location near Buncrana, Co Donegal and before that, it had been based in Letterkenny. He provided the Investigation with copies of his NPPL(A), his medical certification, his pilot's logbook and a current Certificate of Validity – Permit to Fly for G-GTEE. However, he was unable to provide the aircraft logbook. He stated that the aircraft had undertaken its last annual inspection in Northern Ireland earlier in 2012 and that it had not been de-rigged since that time.

The Investigation asked him about the weather conditions on the day of the accident. He said that while it was turbulent, he was well experienced with wind conditions in Donegal where there was always turbulence from the hills. He was confident in his own abilities and those of the machine in such conditions. He agreed on reflection that the maximum wind specified in the Operating Limitations in the GT450 Operator's Manual was 20 kts (23 mph). He said that he had checked the weather before departure from Buncrana on an App on his phone and that the wind had been about 15 kts when he initially took off.

The Pilot stated that he had attended a function the night before the accident and that he left at around 2 a.m. (local time) and travelled home. He said that the following morning he was in "*good enough form*". He felt that a late night wouldn't bother him as he was young and fit.

He stated that the only modification he had made to G-GTEE since he had purchased it was the installation of a new windshield. When asked about his style of flying he said that *"If the aircraft was capable of doing it, I'd be doing it on it"*. When asked about roll angles, he said that *"You'd be doing sixty, sixty five, which is pretty sharp…"*

1.2 Injuries to Persons

Injuries	Crew	Passengers	Others
Fatal	0	0	0
Serious	1	0	0
Minor/None	0	0	

1.3 Damage to Aircraft

5 The aircraft was destroyed.

1.4 Personnel Information

The Pilot held an NPPL(A) initially issued by the UK CAA on 25 June 2010. His Microlight (Land) rating showed 11 April 2010 as the first Date of Test/Check and was valid until 10 April 2014. Medical certification appropriate to the UK CAA NPPL is based on UK Driver and Vehicle Licensing Agency (DVLA) standards and the Pilot held certification for Group 2 (Professional Driving) issued by a General Practitioner.

The Pilot's logbook shows that he commenced microlight training in April 2008 and that he had total flying experience of 341 hrs 50 mins at the time of the accident. The Investigation noted that entries for 56 hrs 05 mins of this flying time were annotated by a Chief Flying Instructor on 14 April 2010 as "*Log book entries entered in error. These do not apply for Licence Application*". The logbook shows that this flying was carried out between 31 July 2009 and 21 February 2010 in a Pegasus Quantum 15 microlight.

1.5 Aircraft Information

The Quik GT450 is a two-seat flexwing microlight aircraft with a maximum take-off weight (MTOW) of 450 kg **(Photo No. 1)**. The occupants are seated in a trike which is suspended beneath the wing. The pilot's seat is equipped with a 3-point harness, i.e. a lap strap and a shoulder restraint. The Operator's Manual states that these should be worn at all times.

Photo No. 1: Quik GT450 in flight

The GT450 sail is manufactured from high strength polyester fabric, with panels joined by double-stitched seams of ultraviolet (UV) resistant thread. The wing aerofoil section is defined by tubular aluminium leading edge and cross spar assemblies and by pre-formed aluminium/composite ribs (battens), with chord-wise tension being maintained by attachment to the trailing edge. The sail is reinforced using additional material at points of high stress. On G-GTEE, this included a reinforcement band of aramid[6] X-05 at the trailing edge. This high-stiffness band controls wash-out and hence prevents the sail from stretching, thus maintaining aerodynamic performance.

The GT450 Operator's Manual set out an annual/100 hour load test on the sail material and stitching, requiring it to withstand a test load of 1360 grams. Following a GT450 in-flight incident during 2010, the sail was examined by the aircraft manufacturers. Thereafter, they issued mandatory Service Bulletin (SB) No. 132 dated 10 January 2011. This introduced an additional test to directly measure the strength of the reinforcement band cords. The requirement for aramid X-05 was to withstand a test load of 6 kgf[7]. The UK Civil Aviation Authority (CAA) subsequently issued a Mandatory Permit Directive (MPD) which required the test described in SB No. 132 to be performed on applicable aircraft (which included G-GTEE) within the next 25 flying hours and at each annual inspection thereafter.

The aircraft manufacturers also issued an advisory SB No. 133 dated 2 February 2011 which set out a programme to test for degradation of the materials used in their flexwing sails, due to the exposure of those materials to UV light. This SB included descriptions of tests of sail fabric, stitching and reinforcement bands and required that the tests be carried out at each Permit to Fly revalidation inspection.

Records indicated that G-GTEE's total flying time was approximately 1050 hours. The most recent annual inspection for a Permit to Fly revalidation was carried out by a British Microlight Aircraft Association (BMAA) registered inspector in Northern Ireland on 1 June 2012. The Certificate of Validity – Permit to Fly was effective from 7 June 2012 to 31 May 2013.

[6] **Aramid**: Any of a group of lightweight but very strong synthetic polymers that may be fashioned into fibres.
[7] **kgf:** kilogram-force, a unit of force.

The test schedule showed that all the required checks for the sail were passed without comment. The inspector confirmed to the Investigation that the sail had successfully achieved all the required loadings at the various zones, including the 6 kgf pull on the aramid trailing edge reinforcement band. As these checks were not intended to test the material to its ultimate failure point, no specific loadings were recorded, nor were they required to be.

1.6 Meteorological Information

The Investigation requested that Met Éireann provide a weather report for the accident location at the time of the event.

Met Éireann reported that an area of low pressure centred just south of Iceland was driving a strong southwesterly flow over Ireland as a frontal trough was just clearing the southeast of the country. The weather was generally fine, with few/scattered clouds at 2,000 to 2,500 ft and broken cloud at 3,000 to 4,000 ft. Visibility was reported to be circa 20 km.

The winds were reported as follows:-

Surface: 240° 15-20 kts, gusting 25-30 kts (with a risk of gusts to 35 kts).
2000 feet: 250° 30-35 kts.

1.7 Wreckage and Impact Information

7 The aircraft impacted heavily in a wet agricultural field **(Photo No. 2)**. It continued along a track of approximately 337°M[8] for a distance of 21.6 m from the initial impact point before coming to rest.

Photo No. 2: General View of Accident Site

The initial impact left deep scars in the soft ground. The starboard undercarriage leg was embedded in the soil close to the first impact mark, with the corresponding wheel hub nearby. One of the propeller blades was also deeply embedded in a slash in the ground adjacent to the initial impact point.

[8] **M**: Magnetic

There was another deep impact mark approximately 5 m from the position of the blade slash, with the starboard composite wing tip on the ground alongside this mark.

The trike was resting on its right side, with the port undercarriage assembly undamaged and pointing upwards. The rear part of the trike remained relatively intact with the seats both in place. The area around the instrument panel sustained severe impact damage while the nose cone itself was largely intact. The shoulder restraint was not in use and was clipped together behind the pilot's seat. The engine remained attached to the rear of the trike and the propeller hub remained attached to the engine, although two of the three blades had sheared off close to the blade root. The third blade was undamaged. The pitch trim system was set to full fast, which would have served to maximise airspeed, while the port wing tip adjuster was set three divisions down (faster) than standard. The starboard wing tip adjuster had been damaged in the ground impact and consequently its position could not be relied upon.

The sail had failed in a longitudinal direction just outboard and to the right of the keel pocket which runs fore and aft along the sail centreline **(Photo No. 3)**.

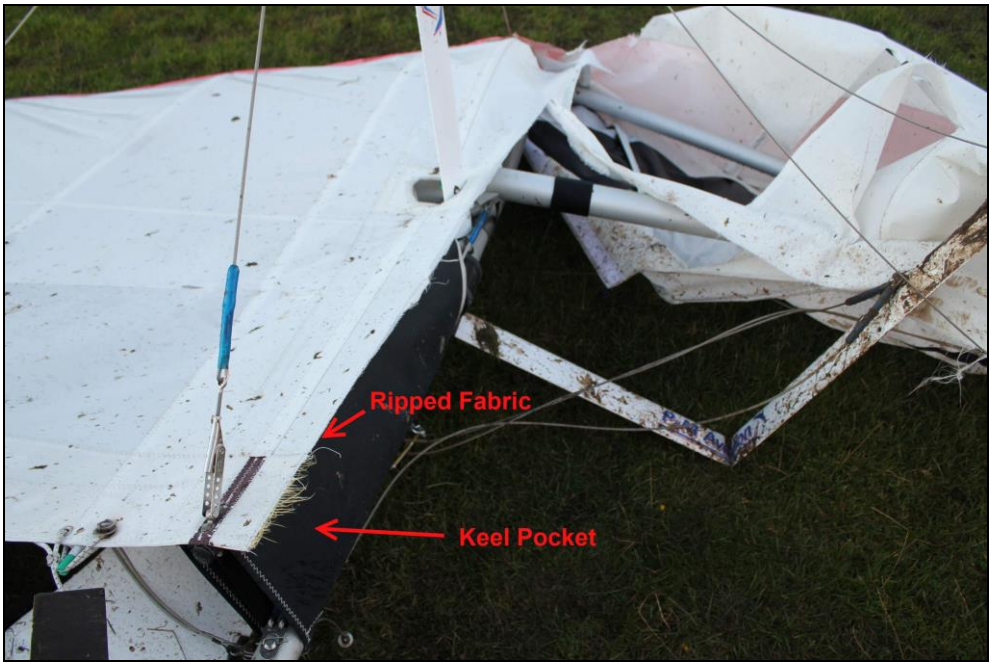

Photo No. 3: Sail failure viewed from above.

The failure extended from the aramid trailing edge forward towards the nose, through a distance well in excess of 50% of the sail's chord. The adjacent trailing edge shift cable grommet had ripped out of the sail, thus allowing the split to open completely. The sail fabric was muddy on the starboard side of the split but relatively clean on the keel pocket side.

A clean panel of fabric from the starboard wing, measuring approximately 60 cm by 20 cm, was found approximately 90 m from the wreckage and a batten bungee cord was found approximately 50 m from the wreckage. The tubular leading edge and cross spar assemblies from the starboard side of the wing were found to be bent through 90°, whereas the port side of the wing was found to have sustained no damage. It was noted that the Manufacturer had colour coded the wing battens, red for the port side of the sail and green for the starboard. However, all of the red battens were installed on the starboard side and all of the green battens were on the port side.

1.8 Tests and Research

Following the accident, the AAIU made arrangements to have samples of the sail material tested in the UK under BMAA oversight. These tests included sail rip and aramid fibre pull tests as would be required for Permit to Fly revalidation inspection. It was found that the sail material was ripping at loads of 900 to 1000 grams whereas the test procedure required the material to withstand a minimum load of 1360 grams.

The aramid strands failed at 5 to 6 kgf on the hook pull test; the requirement under SB No. 132 being 6 kgf. Thus, if the sail had been presented for a Permit renewal inspection at the time of the post-accident testing (October 2012), the material would have failed the inspection and the sail would have been scrapped.

The trailing edge root area from the intact port side of the G-GTEE's sail was cut into five 50 mm wide strips to facilitate load tests of material strength. Percentage strain at the point of material failure was also measured for these five strips. For two of the strips, one constructed from 2 plies of aramid and 2 plies of polyester, and the other constructed of one ply of aramid and 2 plies of polyester, the testing showed that G-GTEE's sail was capable of taking only 83% of the ultimate load (+6g at 450 kg MTOW) in the aramid band area. This area is critical because it is much stiffer (in the order of ten times) than the polyester sailcloth and it fails at a lower strain (approximately 1/9th that of the polyester sailcloth).

Subsequently, a representative from the aircraft Manufacturer visited the AAIU facility in Gormanston to examine the wreckage and to carry out further testing of the sailcloth under the oversight of the AAIU. The sail polyester material was found to rip at an average load of between 900 and 1100 grams in both the warp (span-wise) and weft (chord-wise) directions. The aramid strands were found to fail under the hook test at 5 kgf.

Following the testing, the Manufacturer re-issued SB No. 132 at Issue 2 on 21 November 2012. This increased the reinforcement band test loads from 6 kgf to 9 kgf for aramid X-05 and from 5 kgf to 8 kgf for black Technora[9] spanwise cords. The test loads were increased to provide an acceptable reserve factor for sailcloth which had degraded over time. SB No. 132 Issue 2 also required that the inspector enter *"sail reinforcement test to XX kg carried out to SB 132 issue 2"* into the aircraft technical logbook.

The UK CAA issued an Emergency MPD No. 2012-005-E, also dated 21 November 2012, requiring the tests described in SB No. 132 Issue 2 to be performed on applicable sails more than 2 years old or with more than 500 hours flight time. Compliance was required within the next 10 flight hours or 4 months from the effective date of the MPD, whichever occurred first. The MPD also directed that high g manoeuvres were to be avoided during this period. The tests were mandated for all applicable aircraft at each annual inspection. It is noteworthy that at the time of writing, SB No. 132 has been further revised to Issue 4, although the test loads have not changed. Issue 3 required the tests to be done with a slack sail and Issue 4 clarified the test procedure.

[9] **Technora**: A para-aramid which is stronger and slightly less stiff than aramid X-05. The aircraft Manufacturer changed the reinforcement panels on newly manufactured sails to Technora during 2010.

1.9 Ultraviolet Degradation of Sails/Covers

Unpainted sails/covers, such as those fitted to weight-shift and 3-axis control microlight aircraft, are degraded and lose strength by exposure to the UV radiation which is present in sunlight. Affected microlight types, such as the GT450, are subject to residual strength testing as part of the annual inspection for revalidation of their Permits to Fly. The BMAA issued Technical Information Leaflet No. 068 in August 2011, dealing with UV degradation of aircraft coverings.

The document contains a Warning to the effect that "*A successful Permit to Fly revalidation inspection does **not** guarantee that the sail/covers will remain airworthy for the next 12 months!*" The BMAA document, which may be accessed at the following link, http://www.bmaa.org/files/068_1_uv_degradation.pdf, advises microlight owners of how to store and operate their aircraft to minimise sail/cover degradation due to UV radiation. It also advises owners when to consider performing additional residual strength testing between Permit to Fly revalidation inspections.

2. ANALYSIS

From examination of the wreckage it was evident that the sail had split from the starboard trailing edge running forward towards the nose, just to the right of the central keel pocket. The starboard trailing edge shift cable grommet had failed which, had it remained intact, might have served to restrict how far the split travelled. However, due to the failure of this grommet, the shift cable was ineffective and the sail ripped along more than 50% of its fore and aft axis. A clean panel of fabric, which was identified as coming from the right hand side of the sail, was found a considerable distance away from the final resting position of the remainder of the sail. The area of the sail from which this had come was muddy in stark contrast to the clean panel.

The nature of the sail failure would have caused a major loss of lift on the starboard wing and in the wing root area which in turn would have caused the starboard wing and the nose to drop. The evidence available from the wreckage, in which the starboard side of the aircraft and the starboard wing structure were severely damaged, was that G-GTEE had impacted the ground with its starboard wing down. The impact marks in the field also supported this scenario.

Post-accident testing of the sail material showed that the both the polyester sailcloth and the aramid reinforcement band possessed insufficient residual strength to pass the annual pull tests required for Permit to Fly renewal and thus the sail would have been scrapped if being tested for a Permit renewal at that time. However, the same sail tests had been successfully accomplished on 1 June 2012, although no specific values had been recorded at that time nor were they required to be. Therefore, the Investigation believes that the sail had been subject to further degradation and loss of strength due to exposure to UV radiation during the period following its Permit renewal, during which time it remained fully rigged at all times.

It is probable that, on the day of the accident, the microlight was being flown outside the maximum wind limitation of 20 kts/23mph as specified in the GT450 Operator's Manual.
The Met Éireann aftercast stated that the winds at ground level were 15-20 kts gusting 25-30 kts (with a risk of gusts to 35 kts) while an experienced microlight pilot who witnessed the accident estimated that the blustery wind was gusting to 25 kts at the time.

The pitch trim system was set to full fast which would have given a pilot the maximum control response but would also have maximised the gust and manoeuvre loads. It is probable that high gust loads experienced while flying the microlight at high airspeed in gusty and turbulent conditions led to the in-flight failure of the degraded wing.

It was noted that the red battens were all in the starboard wing and the green battens were all in the port wing, i.e. the wrong way round. If batten profile adjustment is used to tune out turns as described in the Operator's Manual, a turn correction will give an amplified turn if the battens are swapped over. However, G-GTEE had been flying without any apparent turning issues and it is considered that the swapped battens were not a factor in the accident.

The Pilot was wearing only the lap strap on the accident flight and the shoulder restraint was not in use. Failure to use a shoulder strap significantly increases the probability of the occupant(s) sustaining serious injuries in an accident.

Within two months of the accident, the Manufacturer issued a revised SB No. 132 increasing the test loads on the sail reinforcement panels. The UK CAA simultaneously issued an Emergency MPD 2012-005-E requiring that the tests described in the SB be carried out expeditiously on applicable sails and thereafter at each annual inspection. Therefore, the Investigation considers that a Safety Recommendation in this regard is not required.

The Investigation considers that following this accident, it is opportune to issue a reminder to the microlighting community in Ireland regarding the potential hazards which may arise from UV degradation of sailcloth material. Therefore, the Investigation issues the following Safety Recommendation to the General Aviation Safety Council of Ireland (GASCI). Following review of the Draft Report, the Chairman of GASCI informed the Investigation that the Council accepted the Safety Recommendation and would action it following publication of the Final Report.

Safety Recommendation No. 1
It is recommended that the General Aviation Safety Council of Ireland should conduct an awareness programme for their applicable membership, on the hazards associated with ultraviolet degradation of microlight sails and covers and on measures which may be taken to mitigate such hazards. (**IRLD2014026**)

3. CONCLUSIONS

(a) Findings

1. The Pilot held a UK National Private Pilot's Licence (Aeroplanes).

2. The microlight held a Permit to Fly effective until 31 May 2013.

3. The sail had passed the applicable strength degradation tests on 1 June 2012.

4. It is probable that, at the time of the accident, the microlight was being flown in wind conditions which were outside the limits specified in the Operator's Manual.

5. The meteorological conditions, combined with the full fast setting of the pitch trim system, maximised the gust and manoeuvre loads experienced by the microlight.

6. The sail failed in-flight by splitting from the reinforced panel at the trailing edge forward towards the nose, just to the right of the centreline keel pocket.

7. The sail failure caused a major loss of lift on the starboard wing and in the wing root area.

8. The microlight entered a rapid descent and impacted into a wet agricultural field.

9. Subsequent tests on the sail indicated that its residual strength had degraded to values below the minimum specified requirements.

10. The Pilot sustained serious injuries.

(b) Probable Cause

1. In-flight failure of the sail resulting in a major loss of lift on the starboard wing and in the wing root area.

(c) Contributory Cause(s)

1. Degradation of the strength of the sailcloth material to values lower than the minimum specified requirements, due to exposure to UV radiation.

2. Operation of the microlight in conditions which maximised the gust and manoeuvre loads being experienced.

4. SAFETY RECOMMENDATIONS

No.	It is Recommended that:	Recommendation Ref.
1.	The General Aviation Safety Council of Ireland should conduct an awareness programme for their applicable membership, on the hazards associated with ultraviolet degradation of microlight sails and covers and on measures which may be taken to mitigate such hazards.	IRLD2014026

View Safety Recommendations for Report 2014-014

- END -

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.

Produced by the Air Accident Investigation Unit

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An Roinn Iompair Turasóireachta agus Spóirt

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