FINAL REPORT

AAIU Report No: 2010-005
State File No: IRL00910015
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In accordance with the provisions of SI 460 of 2009, the Chief Inspector of Air Accidents Mr. Jurgen Whyte, on 7 March 2010, appointed himself as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Report. The sole purpose of this Investigation is the prevention of aviation Accidents and Incidents. It is not the purpose of the Investigation to apportion blame or liability.

Aircraft Type and Registration:	Schleicher ASK 13 (Glider) EI-GLD
No. and Type of Engines:	N/A
Aircraft Serial Number:	13131
Year of Manufacture:	1969
Date and Time (UTC):	6 March 2010 @ 15.35 hrs
Location:	Field adjacent to Gowran Grange Airfield, Punchestown, Co. Kildare
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - Nil
Injuries:	Crew - 1 (Minor)
Nature of Damage:	Significant
Commander's Licence:	Bronze C Cert issued by the Irish Gliding & Soaring Association (IGSA)
Commander's Details:	Male, aged 63 years
Commander's Flying Experience:	123 hours, of which 45 hours were on type
Notification Source:	Dublin Gliding Club
Information Source:	AAIU Pilot Report Form submitted by Pilot

SYNOPSIS

The glider became low on the approach to Gowran Grange Airfield, struck electricity supply cables, stalled and impacted nose first into a ploughed field adjacent to the intended landing area. The glider suffered significant damage. The Pilot evacuated the glider unaided and reported receiving only minor scratch injuries.

NOTIFICATION

The Deputy Chief Flying Instructor (CFI) of the Dublin Gliding Club notified the AAIU shortly after the accident occurred.

FINAL REPORT

1. FACTUAL INFORMATION

1.1 History of the Flight

Prior to the flight, the Pilot had been briefed by the Duty Instructor to conduct a cross-field landing on his return to Gowran Grange. The take-off at 15.20 hrs from Runway (RWY) 03 was uneventful and the glider climbed, under aerotow[1], to 2,000 ft. At 2,000 ft, the glider released from aerotow and glided towards the northeast side of the airfield where it encountered some wave lift. However, as this lift was insufficient to sustain a climb, the Pilot elected to position for a right-hand circuit in order to carry out a cross-field landing at the southern end of Gowran Grange (**Appendix A - Graphic No. 1**).

The glider turned downwind south of the airfield and then southwest for base leg. Final approach was set up for a cross-field landing in a general easterly direction. During the final approach, the Pilot reported that he became too low and attempted an undershoot procedure[2]. However, the gilder remained low on approach and clipped a set of electricity supply cables, which were running at right angles to the flight path. The speed on contact with cables was approximately 50 kt. The glider nosed-down and impacted near the boundary hedgerow of the ploughed field (15.35 hrs), which was adjacent to the intended landing area.

The Pilot extracted himself from the glider unaided and reported only suffering minor scratches. He reported no control difficulties with the glider.

Observations from the ground indicate that the airbrakes remained partially deployed up to the point of impact.

1.2 Damage

The canopy split apart on ground impact. The nose and forward cockpit section was compressed upwards and the starboard wing was damaged approximately halfway along the aileron cut out (**Photo No. 1**).

1.3 Other Damage

The glider clipped a set of electricity supply cables, which in turn made contact with each other, but did not break. A circuit breaker was tripped in the local sub-station with a subsequent local loss of power for a short duration.

1.4 Glider Description

1.4.1 General

The ASK 13 is a two-seater glider built by the Schleicher Company in Germany. It first flew in prototype form in July 1966 and by January 1978 a total of approximately 700 ASK 13s had been built. It was, and still is, widely used for *ab-initio* training of glider pilots.

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[1] **Aerotow:** The glider is attached to a powered aircraft by a tow-cable and towed into the air. The glider releases the cable when the required altitude and position is reached.

[2] **Undershoot Procedure:** This is achieved by diving the glider to increase airspeed, improving the effective approach angle by getting into lower headwinds at very low height and then using that extra speed to initiate a climb over the boundary hedge.

It is constructed from a mixture of materials, including metal, wood and glassfibre. It has swept-forward single-spar wings, which allow for a large blown canopy and good all-round view for both pilots. The 6° forward sweep of the wing allows the rear pilot to be seated near the centres of gravity and lift. The glider therefore behaves in the same way when it is flown dual and solo. The D-type leading edge torsion box is constructed of plywood and the whole wing is fabric-covered. There are metal air brakes above and below the wing, and the wooden ailerons are fabric-covered. The fuselage is a welded steel tube structure with spruce stringers and fabric-covered overall, except for the nose, which is glassfibre. The tail unit is plywood-covered, except for the rear parts of the rudder and elevators, which are fabric-covered, and there is a trim tab in the starboard elevator. Landing gear consists of a non-retractable sprung wheel, mounted aft of the centre of gravity and a nose/tail skid.

1.4.2 Technical Information

Empty Weight:	650 lbs
Maximum Weight:	1,060 lbs
Maximum Speed:	108 kt
Rough Air:	75 kt
Aerotow Speed:	75 kt
Approach Speed:	43-48 kt
Maximum Glide Ratio:	28:1
Rate of Sink:	160 ft/min

Stalling Speed with an all up weight of:

840 lbs is 30 kt
1040 lbs is 33 kt

Speed at:

Minimum sink is 35 kt
Optimum Glide is 43 kt

1.5 Weather

The forecast and actual weather conditions as used by the Pilot on the day of the accident were as follows:

Weather	Forecast	Actual
Wind (speed/direction):	NE 07 – 08 kt	050 - 080°/08 kt
Visibility:	Good	Good
Significant Weather:	Nil	Nil
Cloud:	SCT at 2,500 ft	SCT 2,500-3,000 ft
Temp/Dew Point:	7°C/3°C	7°C/3°C

1.6 Pilot Information

The Pilot had accumulated a total of 65 hours over 383 flights on different glider types. For the accident type he had flown 45 hours over 154 flights of which 13 hours and 36 flights were as Pilot-In-Command (PIC). He had a valid Bronze C Cert and a Self-Declaration Medical Cert.

1.7 Use of Airbrakes

1.7.1 General

Gliders are designed to fly with minimum loss of height (or sink) for a given forward movement. This is known as the glide angle. As such it would be very difficult to land them, without some means of decreasing this glide angle. Therefore, gliders are fitted with airbrakes (or dive brakes) to increase the rate of sink and reduce the glide angle. The airbrakes are also designed to restrict airspeed in a loss of control situation. Airbrakes normally project upwards from the wings (some also project downwards as was the case with EI-GLD), under the control of the pilot, thus increasing the gliders drag and rate of sink. They do not alter the glider's minimum flying speed appreciably. When partially deployed (opened) the upper brakes will spoil the lift. But when fully deployed they present a large vertical surface area and so provide significant drag and sink. As such the deployment and retraction of airbrakes and the degree in which this is done, varies during the approach and landing phase.

The final turn is used to align the glider for a straight-in approach to the landing area. It is normally initiated early enough to avoid overshooting the centreline of the intended approach.

The final turn must be conducted at a safe altitude and safe speed, having regard for local conditions. Good energy management (height/speed) is critical to safety, and to setting up a good stable approach from which the landing can be accomplished.

Once the turn is completed, the approach speed and direction are checked, adjusted if necessary using the airbrakes, and then maintained until the flare or round out. Thus the airbrakes are used as required to maintain the correct stabilised approach path.

The landing phase covers the transition from the stabilised approach, through the flare, hold off, and ground roll, until stationary.

A stable approach is normally maintained at the nominated approach speed of approximately 50 kt (43-48 kt for EI-GLD). When clearance of any obstacle on the approach is assured, the approach should continue ideally at approximately half airbrake. Any tendency to undershoot or overshoot the aiming point (landing area) should be corrected by appropriate adjustment of the airbrake settings.

Following a stabilised approach, the glider transitions (flares) to a point where the descent rate is arrested and changes to zero with the glider flying parallel (hold-off) to the ground. The hold-off phase is sustained at a steady height of approximately one foot while bleeding off energy (speed) and until the glider settles onto the ground in the touchdown attitude. Full airbrake is normally deployed once the glider is firmly on the ground. This is followed by application of wheel brakes as required.

1.7.2 Airbrake EI-GLD

The airbrakes on EI-GLD are deployed manually through a push/pull lever and project upwards from the upper surface of the wing and downwards from the lower surface of the wing at the same time.

The relationship between the amount by which the airbrake lever is opened and the amount by which the airbrakes actually open is roughly directly proportional, i.e., if the airbrake lever is opened to about half-way along its travel, then the airbrakes will then be half-open.

Observations from the ground on the day of the accident indicate that the airbrakes were partially deployed up to ground impact. Examination of the glider on the ground indicated that the airbrakes were deployed to approximately 25% of full deployment. **(Photo No. 1)**

Photo No. 1: Damage to EI-GLD and part deployment of airbrake above and below wing (red arrow)

2. ANALYSIS

While conducting an approach to a cross-field landing at Gowran Grange, the glider descended below the normal glide approach path and struck electricity supply cables. Following the cable strike, the glider stalled and nose-dived into a ploughed field adjacent to the intended landing area.

Observations from the ground and examination of the glider following impact indicate that the airbrakes were partially deployed up to ground impact.

Airbrakes are normally used as required to establish and maintain the correct final stabilised approach path. Once established, the approach glide path should be constant and clear of all obstacles.

Under normal circumstances approximately 50% of airbrake is deployed during the final stabilized approach. However, in this particular case the glider became low on the descent profile and, as such, the rate of descent should have been checked by retracting the airbrakes fully to recover the correct approach glide path. The initiation of the undershoot procedure, in order to gain speed and height, with the airbrakes still partially deployed, would have exacerbated the rate of descent, as the drag would have increased due to the increased airspeed. The glider descended to a height where it made contact with the electricity supply lines, following which, it stalled and nose-dived into the ploughed field.

3. CONCLUSIONS

(a) Findings

1. The glider became low on approach and struck electricity supply cables.

2. The glider stalled and impacted heavily nose first into a plough field adjacent to the intended landing area.

3. When the glider descended below the required safe approach path, the required corrective action was not used, i.e., fully close/retract the airbrakes.

4. It is possible that the Pilot was unaware that the airbrakes were still partially deployed during the attempted undershoot procedure.

(b) Probable Cause

The glider struck electricity supply cables following descent below a safe stabilised approach path.

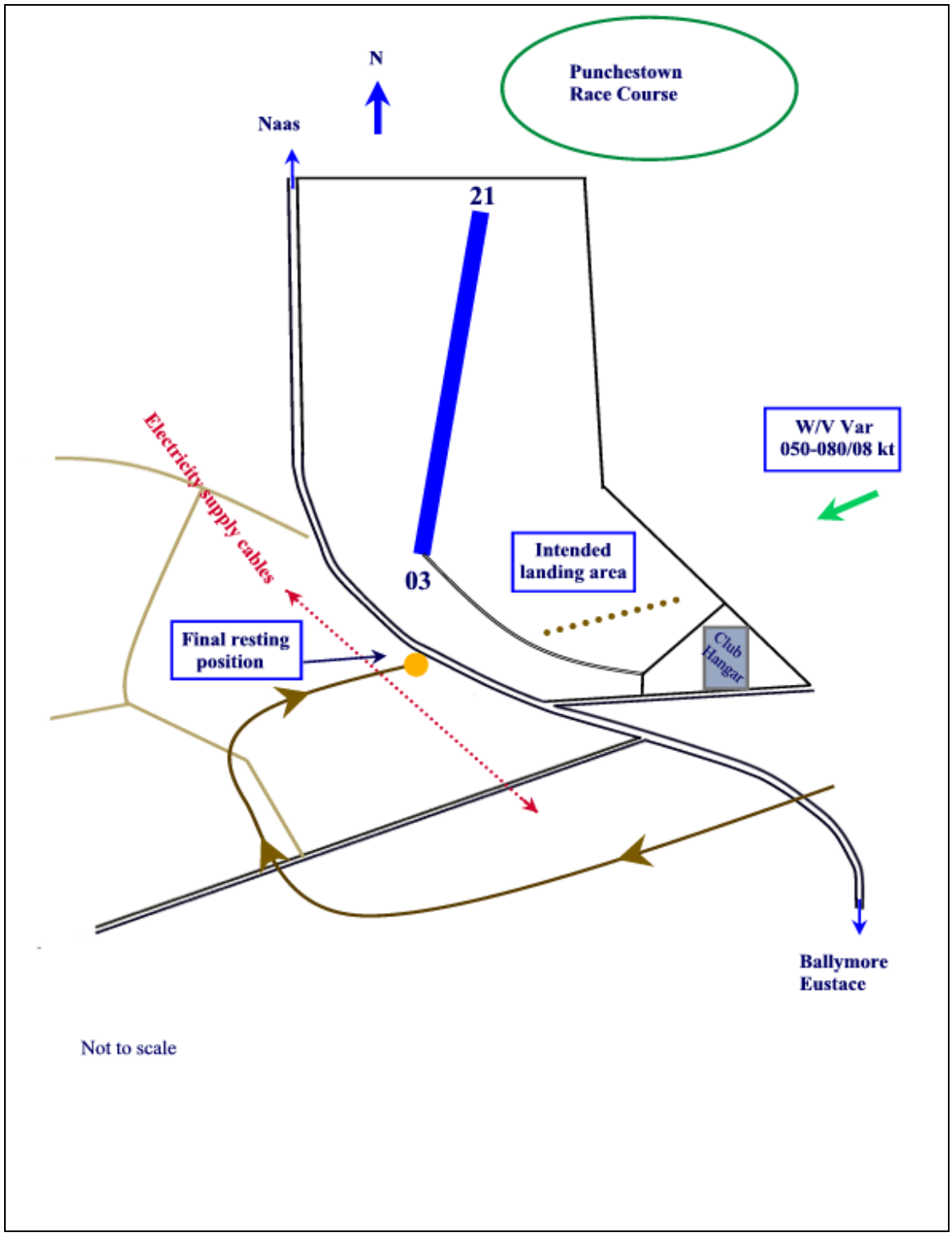
(c) Contributory Cause

1. Non-retraction of airbrakes following increased rate of descent during approach.

4. SAFETY RECOMMENDATIONS

This Investigation does not sustain any safety recommendations.

APPENDIX A



Graphic No. 1: General depiction of Gowran Grange area, flight path, final resting position of EI-GLD and intended landing area.

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