



Air Accident Investigation Unit Ireland

FACTUAL REPORT

ACCIDENT

**Macfly/Dudek Nemo 4 Paramotor, Unregistered
The Heath, Portlaoise, Co. Laois**

12 June 2021



An Roinn Iompair
Department of Transport

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 13¹ to the Convention on International Civil Aviation, Regulation (EU) No 996/2010² and Statutory Instrument No. 460 of 2009³, 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.

Extracts from this Report may be published providing that the source is acknowledged, the material is accurately reproduced and that it is not used in a derogatory or misleading context.

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.



AAIU Report No: 2023-006

State File No: IRL00921015

Report Format: Factual Report

Published: 3 May 2023

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, the Chief Inspector of Air Accidents, on 22 June 2021, appointed Paul Farrell as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Report.

| | | |
|---|---|-------------------------|
| Aircraft Type and Registration: | Macfly/Dudek Nemo 4 Paramotor, Unregistered | |
| No. and Type of Engines: | 1 x Vittorazi Moster 185 | |
| Aircraft Serial Number: | None provided | |
| Year of Manufacture: | 2021 | |
| Date and Time (UTC)⁴: | 12 June 2021 @ 19:35 hrs | |
| Location: | The Heath, Portlaoise, Co. Laois, Ireland | |
| Type of Operation: | General Aviation | |
| Persons on Board: | Crew – 1 | Passengers – Nil |
| Injuries: | Crew – 1 | |
| Nature of Damage: | Substantial | |
| Commander's Licence: | None | |
| Commander's Age: | 40 years | |
| Commander's Flying Experience: | Nil | |
| Notification Source: | The Instructor | |
| Information Source: | Completed AAIU Report Form submitted by the Instructor | |

⁴ **UTC:** Co-ordinated Universal Time. All times in this report are quoted in UTC unless otherwise stated; local time was UTC plus one hour.

SYNOPSIS

During an exercise intended to teach the paramotor Student to kite and control a paramotor wing (canopy) above his head, the paramotor inadvertently became airborne. The Student who was being supervised by an Instructor, released the throttle instantly but did not use the 'Kill switch/button' to fully de-power the engine. On contacting the ground, the Student fell over on his left side and his left hand made contact with the spinning propeller, injuring two of his fingers. The Student attended a hospital emergency department for immediate treatment, and subsequently underwent surgery at a second hospital.

NOTIFICATION

The AAIU first learned of this event when a completed AAIU Report Form was received from the Instructor 10 days after the accident.

1. FACTUAL INFORMATION

1.1 History of the Flight

The Instructor informed the Investigation that the Student was practising simulated take-off procedures as part of a paramotor⁵ training course. The Instructor stated that the purpose of the exercise was for the student to *'learn the skills needed to kite and control the wing above their head whilst moving forward into wind'*. The Instructor explained that the Student is required to do this with throttle control and body posture. The Instructor, who had radio⁶ contact with the Student, stated that on approximately his fifth attempt, the Student was requested *'to increase a little throttle to assist his run into wind'*. The Instructor reported that the Student applied more throttle than required, which resulted in an unintentional take-off to a height of 10 – 12 feet (ft) above the ground. The Instructor stated that the take-off was followed by his command to *'Release throttle slowly. Flare.'*, and *'Kill the engine.'* The Instructor stated that the Student attempted to flare but didn't kill the engine in the process. The Instructor described the Student as not being in *'a fully stand up position upon landing'*, and said that the Student rolled over on to his left hand side from the inertia. The Instructor reported that with the throttle still at approximately 30%, the Student's hand contacted the spinning propeller, and the Student suffered injuries to the index and middle fingers of his left hand.

⁵ **Paramotor:** means the harness and propulsive elements of a powered paraglider with an unladen mass (including unusable fuel), of no more than 70 kgs. An additional 5 kgs is permitted if the paramotor is equipped with an emergency parachute. A *'powered paraglider'* means a wide canopy resembling a parachute that is attached to a person's body by a harness and which derives lift by means of aerodynamic reactions on the surface of the canopy, supported by a propulsive element—commonly known as a paramotor. (IAA AN No. P.35)

⁶ The radio system in use was a licence free, walkie-talkie system.



The Instructor's opinion was that the accident was caused by the application of too much throttle during the Student's run into wind exercise and that this resulted in an unintended take-off following which the engine was not de-powered using the 'kill' switch/button. The Instructor stated that all students are constantly reminded of the operation of the 'kill switch/button' before any attempt to launch the wing with a running engine.

1.2 Arrangements for the Flight

The Student informed the Investigation that following word-of-mouth recommendations, he contacted the Instructor directly, seeking training to learn to fly a paramotor. The Investigation was informed that the student had agreed to pay for a course of instruction, but that no request for fees has been made to him in the wake of the accident.

The Student informed the Investigation that The Heath location was selected by the Instructor as the location for the training *'due to its local weather and suitability, i.e. an open area with no power lines, etc'*. He was on his second day of training with the Instructor.

1.3 Injuries to Persons

The Student reported that his left index finger was amputated at the top joint and his left middle finger suffered a deep cut with tendon damage. On the evening of the accident, he attended a local hospital for an initial examination, and was then referred to a Dublin-based hospital for surgery on his injuries.

He was discharged from hospital on the following day. After his discharge, he required ongoing medical treatment for his injuries.

Statutory Instrument No. 460 of 2009, *'Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009'* defines *'serious injury'* as *'an injury sustained by a person in an accident that [...] (b) results in a fracture of any bone (except simple fractures of fingers, toes or nose)'. (c) involves laceration which causes severe haemorrhage, nerve, muscle or tendon damage, [...]*'.

1.4 Paramotor Damage

The Instructor informed the Investigation that the paramotor's propeller was broken in the accident sequence. He also reported that the throttle lever was broken and netting around the propeller was damaged.

1.5 Weather

Met Éireann provided the following estimate of meteorological conditions for The Heath, Portlaoise, at the time of the accident. The details are contained in **Table No. 1**.

| | |
|---|---|
| Meteorological Situation: | An elongated anticyclone of 1027 hectopascals (hPa) extends a ridge up over Ireland giving a moderate to fresh southerly airflow. |
| Surface Wind: Wind at 2,000 ft: Surface to 300 ft: | West to southwest 3-7 knots (kt). West 10-15 kt. Similar to surface, with gusts up to 10 kt. |
| Visibility: | 30 km+ |
| Weather: | Cloudy and dry. |
| Cloud: | An overcast (8/8 th oktas ⁷) layer of stratocumulus clouds with bases around 3,000 ft. |
| Surface Temperature/Dew Point: | 19/13 degrees Celsius. |
| Mean Sea Level (MSL) Pressure: | 1026 hPa |
| Freezing Level: | 14,000 ft |

Table No. 1: Meteorological Aftercast

The Instructor described the wind speed and direction at the time of the accident as *'light, south-westerly'*.

1.6 Guidance and Regulations

1.6.1 Registration

IAA Aeronautical Notice (AN) G.13, Issue 2, Dated 20.07.16, extant at the time of the accident, titled *'POWERED PARAGLIDERS'*, stated that:

'Where an aircraft comprises a paraglider, parawing, parachute, foil, canopy or other lifting device, and is operated under power, it is not considered a glider and the requirements of the Order apply.

[...]

It is an offence to operate such aircraft in the State without being individually registered.'

IAA AN G.13 further stated that *'A fire proof plate bearing the assigned nationality mark and registration shall be affixed to the aircraft in accordance with article 11 of the Order.'*

1.6.2 Licensing

IAA AN P.21, Issue: 3, Dated 07.04.17, titled *'Acceptance of Flight Crew Licences'*, was extant at the time of the occurrence and defines an *'appropriate pilot licence'* as *'a pilot licence which is not in conformity with Annex I (Personnel Licensing) to the Chicago Convention and which is issued according to national rules by another ICAO signatory state or by its national aviation authority or qualified entity'*.

⁷ **Okta:** A unit of cloud amount, expressed as a number of eighths of the sky dome covered by clouds.



IAA AN P.21 also set out minimum experience requirements for recognition of flight time experience for powered paragliders. It stated *'This Direction shall not apply to any instructor or examiner privileges that may also be held unless the holder thereof is otherwise authorised in writing to exercise such privileges by the Authority.'* The IAA website provides Form No. RPPL-F-171, AMDT No. 1.0, Dated 22/07/2017, titled *'Application for the issue of an exemption from the requirement to hold a licence for an Irish registered foot-launched Powered Aircraft (FLPA).'*

1.6.3 Flight Permit

IAA AN A.112, Issue 4, dated 6/9/2019, titled *'Flight Permit for a Single Seat Aircraft'*, which was extant at the time of the occurrence stated, *inter alia*, that it applies to powered paragliders and that:

'The notice permits aircraft such as powered paragliders (paramotors) to operate within the State without a Certificate of Airworthiness, subject to certain conditions, including

[...]

- *'n) The registered owner declares to the Irish Aviation Authority that this Flight Permit applies to the aircraft, at the time of registration or, if already registered, before the first flight takes place without an individual Flight Permit or Fitness for Flight'*

IAA Airworthiness Advisory Memorandum (AAM) No. 6, Revision: 02, titled *'Flight Permits and Maintenance of Annex I Aircraft'* Dated 22/6/2020 states, *inter alia*:

- *'Powered Parachutes are required to be registered and hold a Flight Permit. For single-seat aircraft, this may be the Flight Permit issued on IAA Aeronautical Notice A.112.'*

1.6.4 Powered Paragliding (Paramotoring) in Ireland

The IAA published Operations Advisory Memorandum (OAM) No. 15, Rev 01, dated 9/7/20, titled *'Powered Paragliding (Paramotoring) in Ireland'*. The stated purpose of OAM 15 was *'to promulgate general information to persons intending to fly Powered Paragliders (often known as Paramotors) in Irish Airspace.'* It set out, with references to legislation, the General Rules for paramotoring in Ireland under the following headings: Aircraft Registration; Flight Permits and Maintenance; Pilot Licensing; Rules of the Air; Visiting Aircraft; and aerodromes. It stated, *inter alia*,

- *'these aircraft are powered, aviation regulations require that they must be registered and have a valid Certificate of Airworthiness or Flight Permit before they are flown in the State.*
- *Powered Paraglider pilots are also required to hold an appropriate pilot licence or other equivalent qualification valid in Ireland.*
- *Powered Paraglider pilots also need to have permission to take-off and land at the places that they operate from.*

- *Any powered aircraft that comprises a paraglider, parawing, paraglider, foil, canopy or other lifting device, must be registered in Ireland or another ICAO signatory state before it is operated in Ireland.*
- *Under the Irish Aviation Authority (Personnel Licensing) Order, a pilot of a powered Paraglider, wherever registered, flown in the State is required to hold a pilot licence issued or validated by the competent licensing authority of the state in which the aircraft is registered or by the Authority, or an exemption from holding a pilot licence issued in Ireland.*
- *Private aircraft, including Powered Paragliders, may use places not licensed as an aerodrome provided that the pilot of such aircraft holds a valid pilot licence, ensures that landing and take-off at such place can be effected without undue hazard to persons and property, and obtains the prior permission of the owner or occupier of that place’.*

1.6.5 National PPG Licensing

IAA AN No. P.35, Issue 1, Dated 29.04.2021, titled ‘Powered Paraglider Aircraft (PPG) Issue Of Non-ICAO National SPL(PPG), PPL(PPG) and FI(PPG) (with or without restricted privileges)’ states that it was issued ‘because the pilot licensing standards prescribed in SI 333 of 2000 do not align with the need to provide a defined standard for licensing of Powered Paragliders. This direction provides a means for the provision of a licensing standard that is proportional to the flying activity.’ It states, *inter alia*:

- *‘A PPG operator may declare to the Authority to provide training in accordance with a standard acceptable to the Authority.*
 - *The declaration shall be made in such form as is provided by the Authority*
- [...]
- *The Authority may require any such applicant to produce documentary or other satisfactory evidence in support of any particulars given in the application form or of any statement made in relation to the application.’*

IAA AN No. P.35 set out the minimum requirements for a PPG training syllabus. It also set out general rules for PPG Pilots; instituted a National PPL (PPG) with, and without, restricted privileges; defined launch methods, recency requirements, Instructor and assessor requirements, and, the privileges and limitations of a Flight Instructor (PPG) rating. Regarding the AN P.35 reference to ‘*the application form*’, the IAA informed the Investigation that ‘*The use of “application form” in AN P.35 is incorrect, as there is no such application form in use. A declaration is made for the activities intended.*’ The IAA stated that this will be corrected in the next revision of AN P.35.



IAA AN No. P.35 also includes the following definitions:

- *“pre-motorised flight” means free or towed flight with a PHG or PPG, under conditions controlled by and under the responsibility of an instructor, either without the power unit attached or with the power unit attached but the engine off and which, for the purposes of article 5, paragraph (13) of the Order, is considered to be flight in a glider which thereby exempts for the pilot from the requirement to hold a flight crew licence;*
- *“pre-motorised flight and ground instruction” means all unpowered pre-motorised flight instruction, ground handling instruction and theoretical knowledge instruction controlled by and under the responsibility of an instructor, preparing a trainee PPG student for the first solo powered flight under an appropriate Student Pilot Licence (SPL(PPG));’*

1.7 Training Syllabus

The IAA informed the Investigation that training requirements are stipulated in AN P.35 and that prior approval of a syllabus is not required but it shall be submitted when making a declaration under AN P.35. The Instructor stated that the syllabus had been submitted to the IAA in 2020.

In relation to a declaration to the IAA regarding a Declared National PPG Flight Training Organisation, pursuant to IAA AN P.35, the Instructor stated that he was *‘working with the IAA to submit a new Declared Training Organisation [DTO] form, once it was available on their website.’* The IAA informed the Investigation that there is no stipulation that a declaration had to use a form from the website, and that what the AN states is that the declaration must be *‘in a manner acceptable to the Authority’*. The Investigation notes that AN P.35, Section 2.2 states *‘The declaration shall be made in such form as is provided by the Authority and shall furnish such particulars as the Authority may from time to time require. [...]’*.

1.8 Registration, Licensing and Permission

The Instructor stated that the registration requirement as set out in AN G.13 was *‘not applicable as this was a ground handling training glider.’*

The Investigation asked the Instructor to provide copies of all licences that he held in relation to paramotoring. The Instructor provided a copy of a membership card issued to him on 1 February 2008 and which expired on 30 November 2008. The membership card was issued by a UK-based, national organisation. A cover letter with the membership card stated that the Instructor had been awarded his Self-Propelled Hang Gliders (SPHG) Powered Paraglider (PPG) rating.

The Instructor had not submitted an IAA Form RPPL-F-171, which was an *‘Application for the issue of an exemption from the requirement to hold a licence for an Irish registered foot-launched Powered Aircraft (FLPA).’* The Instructor stated that this was because *‘There were no exemptions being issued while the IAA were preparing the new PPG license process.’* The IAA informed the Investigation that RPPL-F-171 was superseded by AN P.35, and that AN P.35 specified the requirements for a Flight Instructor.

FINAL REPORT

The Investigation asked what qualifications and approvals the Instructor held. The Instructor stated that he had:

'22 years paraglider and tandem pilot, 22 years paramotor pilot and over 6 years of paragliding and international paramotor competition flying. Over 1700 pilot hours in total. 400 hours paragliding, 1300+ hours paramotoring. Mentoring many PPG pilots over the last 16 years.'

The IAA informed the Investigation that AN P.35 stipulated the licensing requirements for PPG in Ireland as of, and from, 29 April 2021.

The Investigation requested details of the Instructor's permission from the land owner of The Heath, Portlaoise (as set out in OAM No. 15). No permission details were provided to the Investigation, and the Instructor informed the Investigation that *'No take-off was planned, as this was ground handling training.'*

1.9 Notification of the Accident

Regulation 9 (1) of Statutory Instrument No. 460 of 2009 states:

'When an accident or serious incident to which these Regulations apply occurs, the pilot in command, or if he or she is incapacitated, the operator of the aircraft, shall, as soon as practicable, send notice of the accident or serious incident to the Chief Inspector at the AAIU by the most rapid practicable means available and, in the case of an accident, shall also immediately notify An Garda Síochána.'

The AAIU Website provides a 24-hour telephone number for reporting Accidents and Serious Incidents. The website also states that all accidents and serious incidents are required to be notified to the Air Accident Investigation Unit (AAIU). The AAIU website further states that *'Pilots involved in an event should fill out a Pilot Report Form. You can download a PDF copy of the form or request one from the AAIU at the 24 hour line number given above.'* The introductory text on the form explains that the form is intended to *'[...] assist the AAIU **further** in the investigation [...]*' (emphasis added).

The Instructor informed the Investigation that the AAIU Report Form was posted within 48 hours of the accident and that he was *'not aware of the other methods to report incidents'*.

2. AAIU COMMENT

The Instructor was providing the Student with a course of training when the accident occurred. During a simulated take-off exercise intended to teach the Student to kite and control the wing above his head, the Student inadvertently became airborne. The Student released the throttle immediately and attempted to flare. The engine was not fully de-powered using the *'Kill switch/button'* and consequently the engine was still running. On contacting the ground, the Student fell over on his left hand side and suffered serious injury involving amputation to the top joint of the index finger of his left hand, and a deep cut with tendon damage to his left middle finger.



The training course had been arranged between the Student and the Instructor, and a fee had been agreed for the course although, following the accident, no request for fees was made to the Student.

Weather is not considered to have been a factor in this accident.

In relation to a declaration to the IAA regarding a Declared National PPG Flight Training Organisation, pursuant to IAA AN P.35, the Instructor stated that he was *'working with the IAA to submit a new Declared Training Organisation [DTO] form, once it was available on their website.'* The IAA informed the Investigation that *'The use of "application form" in AN P.35 is incorrect, as there is no such application form in use. A declaration is made for the activities intended.'* The IAA stated that this will be corrected in the next revision of AN P.35. However, the Investigation notes that AN P.35 references to an application form may have caused some confusion for the Instructor regarding the submission of a declaration.

The aircraft had not been registered as required by IAA AN G.13, IAA AAM No. 6, Revision: 02, and IAA OAM No. 15, Rev 01. The Investigation was not provided with details of the land-owner's permission for the operation although the Investigation was informed that *'No take-off was planned, as this was ground handling training.'* However, the Investigation considers that inadvertent take-off and flight were foreseeable consequences, as this accident demonstrates, and as there was nothing inherent in the construction of the accident aircraft to prevent its flight, compliance with registration, and land-owner permission requirements was indicated. In this regard, the Investigation notes that AN P.35 delineates *'pre-motorised flight'* under conditions controlled by and under the responsibility of an instructor, which, for the purposes of article 5, paragraph (13) of the Order, is considered to be flight in a glider which is thereby exempt from the requirement for the pilot to hold a flight crew licence. AN P.35 also stipulates that *'pre-motorised flight and ground instruction'* means all unpowered pre-motorised flight instruction, ground handling instruction and theoretical knowledge instruction controlled by and under the responsibility of an instructor, preparing a trainee PPG student for the first solo powered flight under an appropriate Student Pilot Licence (SPL(PPG)). Therefore, the provisions of AN P.35 do require a Student Pilot to hold a licence prior to undertaking motorised training and their first solo powered flight. Furthermore, the IAA noted in its response to the Draft Final Report that AN P.35 also addresses flight instructor (PPG) licensing requirements.

Independent investigation of aviation Accidents and Serious Incidents is essential to ensure that safety lessons are learned and promulgated. Details of the AAIU 24-hour telephone number for notifying Accidents and Serious Incidents are published on the AAIU's website, and it is imperative that the AAIU is notified at the earliest opportunity.

- 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.

Produced by the Air Accident Investigation Unit

AAIU Reports are available on the Unit website at www.aaiu.ie



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