

الهيئة العامة للطيران المدني  
GENERAL CIVIL AVIATION AUTHORITY



# Air Accident Investigation Sector

## Accident

### - Summary Report -

AAIS Case N° AIFN/0002/2023

# Parachute Ground Impact

Operator:	Skydive Dubai (Club)
Make and Model:	Parachute-Epicene Pro-150
Place of Occurrence:	Margham, Dubai
State of Occurrence:	United Arab Emirates
Date of Occurrence:	16 February 2023



This Investigation was conducted by the Air Accident Investigation Sector of the United Arab Emirates pursuant to Civil Aviation Law No. 20 of 1991, in compliance with Air Accident and Incident Investigation Regulation, and in conformance with the provisions of Annex 13 to the Convention on International Civil Aviation.

This Investigation was conducted independently and without prejudice. The sole objective of the investigation is to prevent future aircraft accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

The Air Accident Investigation Sector issued this Summary Report in accordance with national and international standards and best practices. Consultation with applicable stakeholders, and consideration of their comments, took place prior to the publication of this Report.

The Summary Report is publicly available at:

<http://www.gcaa.gov.ae/en/epublication/pages/investigationReport.aspx>

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## Investigation Process

The occurrence involving a Skydiver, who was equipped with a parachute from Squirrel brand, and impacted the ground resulting in fatal injury.

The occurrence was notified to the Air Accident Investigation Sector (AAIS) Duty Investigator (DI) by phone call to the Hotline Number (+971 50 641 4667) on 16 February 2023, at 15:38 local time of the United Arab Emirates.

After the initial investigation phase, the occurrence was classified as 'Accident' as the Skydiver was fatally injured.

The scope of this investigation is limited to the events leading up to the occurrence; no in-depth analysis of non-contributing factors was undertaken.

### Notes:

1. Whenever the following words are mentioned in this Report with first capital letter, they shall mean the following:
  - (Accident) – This investigated Accident
  - (Investigation) - The investigation into this accident
  - (Club) – Skydive Dubai
  - (Parachute) – The parachute involved in this accident
  - (Report) – This accident investigation Summary Report
  - (Skydiver) – The skydiver involved in the accident.
2. Unless otherwise mentioned, all times in this Report are given in 24-hour clock local time of the United Arab Emirates (LT).
3. The structure of this Summary Report is adapted from the Annex 13 Final Report format.

## Factual Information

### History of the Accident

On 18 January 2023, a visiting Skydiver arrived at Skydive Dubai to register himself for parachute jumping. As per the Operations Manager's statement, the Skydiver's Parachute was checked on that day and was found in a good condition to be used by the Skydiver. In addition, the Skydiver signed a *brief acknowledgement form* in which he stated that he was briefed and will adhere to the Club's safety and organizational rules.

During the period from 19 January to 16 February 2023, the Skydiver has conducted a total of 53 jumps excluding the Accident jump.

On 16 February 2023, at 0900 LT, the Skydiver arrived with two of his friends at the drop zone for parachute jumping. However, as per the closed-circuit television (CCTV) recording, he was denied boarding the aircraft because he did not have his altimeter, which is one of the essential tools for Skydivers.

At approximately 1140 LT, the Skydiver boarded the aircraft, and at approximately 1240 LT he jumped and landed at 1310 LT uneventfully.

At approximately 1500 LT, the Skydiver boarded the aircraft for a second jump on the day. After the freefall, the Parachute lines twisted<sup>1</sup>. The Skydiver attempted to recover by "kicking out"<sup>2</sup> of the situation. However, he was unable to recover from it and decided to perform the emergency procedure.

During the emergency procedure, the Skydiver grabbed the cutaway handle but he was not able to fully extend his arm to cut away the main parachute (figure 1). The Skydiver partially cut away his handle which made him hang on one riser. He grabbed the reserve handle and fully deployed the reserve handle. As a result, the reserve parachute was deployed from its container. However, he grabbed the bridle of the reserve free bag and tried to bring it back to him which caused his bridle to wrap around his arm. He tried to clear the bridle but was unable.

<sup>1</sup> Line twist happens when the parachute rotates around its vertical axis

<sup>2</sup> Kick out refers to the recovery action done by the Skydiver to recover from line twist by rotating his/her body



At approximately 1538 LT, the Skydiver impacted the ground and was fatally injured.



Figure1. Cutaway and reserve handle

### Damage to Aircraft and Property

There was no damage, and the Parachute was intact. However, the line twist was apparent on the Parachute.

### Personnel Information

The Skydiver was a visiting skydiver and he held a valid C license issued by Parachute Association of the United States (USPA).

The holders of a USPA-C license have the following privileges:

1. May jump without supervision, pack their own main parachute, engage in basic group jumps, and perform water jumps.<sup>3 4</sup>
2. Perform night jumps, with 100 jumps are eligible for the USPA coach rating.<sup>5</sup>
3. Eligible for the USPA Instructor rating (except USPA tandem instructor), participate in certain demonstration jumps, may ride as a passenger on USPA tandem instructor training and rating renewal jumps.<sup>6</sup>

The requirements for a skydiver to upgrade to a USPA-C license are as follows:

1. Meet all current requirements for or hold a USPA-B license

2. Complete 200 jumps, including accumulating at least 60 minutes of controlled freefall time
3. Land within seven feet of target center on 25 jumps
4. Complete 50 formation skydives, or 50 formation free-fly skydives, at least 10 of them involve at least 4 participants
5. Pass the USPA written C license exam conducted by a current USPA instructor, examiner, or board member.

The Skydiver has logged a total of 347 jumps, and the last recorded jump was on 12 December 2022. He executed jumps in the Club's premises during January and February 2023 which were not recorded in the log.

### Parachute Information

Table 1 illustrates the Parachute general data.

Table 1. Parachute general data		
Container	Rig checked	Validity
	2 February 2023	Approximately 4,000 jumps
Manufacturer	Mirage System Inc	
Model	G4 Series	
<b>Reserve Canopy</b>		
Manufacturer	Performance Designs	
Model	Optimum 126	
<b>Main Canopy</b>		
Manufacturer	Squirrel LLC	
Model	Epicene Pro 150	
<b>Automatic Activation Device</b>		
Manufacturer	Airtec GmbH & Co.KG Safety Systems	
Model	Changeable-Mode CYPRES 2	
<b>Reserve Static Line</b>		
Manufacturer	Mirage System Inc	
Model	G4 Series	

3 USPA-A license privileges.

4 Water jumps are preplanned parachute jumps into an open body of water more than 1.5 m (5 ft) in depth.

5 USPA-B license privileges



## Aerodrome Information

The Club has two jump locations in the emirate of Dubai. The one in which the Accident occurred is designated as OMR26 and located in Margham.



Figure 2. The Parachute impact point

## Meteorology Information

The weather information was checked through the website of the Aviation Meteorology Centre [www.avmet.ae](http://www.avmet.ae), which is operated by the United Arab Emirates National Center of Meteorology (NCM). The website provides around-the-clock weather information in the form of Metrological Aerodrome Report (METAR)<sup>7</sup> and Terminal Area Forecast (TAF)<sup>8</sup>.

At the time of the Accident between 1500 and 1600 LT, the wind speed on the ground was ranging from 14 to 17 knots. This is based on the report extracted from the website of NCM.

## Organizational and Management Information

The Club operates under Parachute Approved Organization (PAO) approval issued by the General Civil Aviation Authority of the United Arab Emirates (GCAA) under Civil Aviation Regulations – Light Sport Aircraft (CAR-LSA).

### Organizational structure

According to the Club's organizational structure, the following job roles are designated

and directly related to the day-to-day parachute operations:

- Accountable Manager
- Operations Manager (Palm Drop Zone)
- Operations Manager (Desert Drop Zone)
- Special Project Manager
- Safety & Compliance Manager
- Manifest Manager and Manifest
- Chief Instructor and Instructor
- Ground Controller
- Rigging Loft Manager
- Parachute Rigger and Parachute Packer.
- Load Master.

## Additional Information

### Wind gust limits for suspension and resumption of parachuting activities

As per the Club's *operating manual (OM)*, parachuting must be suspended in case two gusts above the limit take place within five minutes. Suspension must not be released before the elapse of 30 minutes and including no out of limits gusts occur.

The *OM* outlined the wind limits for licensed parachutists to 24 knots. The *OM* mentioned that the wind speed and direction must be obtained by either using anemometer, or from meteorological forecasts obtained from the NCM. The information must be available before the parachuting begins and following a significant change in wind speed or direction.

### Safety brief in the Club's premises

The Club was equipped with two media for addressing important safety matters, rules and recommendations: A poster that contained bullet points about the rules and recommendations that skydivers need to adhere to; and a safety video briefing that covers the following topics. The skydivers are required to acknowledge that they

<sup>7</sup> METAR: is a [coded] format for reporting weather information and it is updated every hour.

<sup>8</sup> TAF: a statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace



have received the briefing by signing the *brief acknowledgement form* provided by the Club.

The Investigation noticed that neither the poster brief nor the safety video contained a brief about line twist recovery.

### Factors leading to line twist

As per the USPA<sup>9</sup>, wind gust is one of the most common causes of parachute's line twist. This is because gusty winds can cause the parachute to oscillate, which can lead to the lines twisting around each other. If the line twist is complicated, they can prevent the parachute from opening properly.

As a preventive measure, skydivers shall be fully aware of the wind conditions and avoid jumping in case of gusty winds beyond limits.

The USPA emphasizes that parachutists need to treat line twist more seriously as a malfunction that requires immediate action. The recovery actions are as follows:

- “
- As soon as you find yourself orbiting around your spinning main parachute, immediately pull the cutaway handle and deploy the reserve. A faster reaction maximizes the altitude remaining for a reserve deployment and makes it easier to extract the cutaway handle from the main lift web because the harness is not yet highly loaded. The sooner is better.
  - Use a Reserve Static Line (RSL) or main assisted reserve deployment (MARD)<sup>10</sup>. Many fatalities occur after the Skydiver releases the main parachute at a sufficient altitude but fails to pull the reserve in time. An immediate reserve deployment via a Reserve Static Line RSL or MARD is vital to recovering from the emergency. “

A skydiver can prevent line twist by jumping larger canopies at lighter wing loadings, packing carefully, stowing brakes securely, and deploying in

a stable body position with shoulders level with the horizon.

## Analysis

### The Effect of the Gusting Wind

The Investigation reviewed the wind direction and speed between 0900 and 1300, the video of the Accident, and the statement made by the Operations Manager. It was found that wind gust occurred during the time of the Accident. Accordingly, the operation was suspended (as per the Operations Manager statement).

When the wind became within limits, the operations resumed. However for the decision making whether to resume or stop the operations, the Club solely relied on the weather data on that day for the surface wind. There was no consultation of the historical wind or the wind speed above ground surface level which can still be gusting..

In addition, the video of the Accident showed that the weather was windy at the altitude in which the jump occurred. The wind between 1100 and 1200 LT was south westerly gusting between 14 knots to 16 knots.

### Brief About Recovery from Line Twist

The Investigation has noticed that the Club lacked brief material about line twist as a part of the safety briefing. The absence of such brief, eliminates a barrier that can significantly reduce the likelihood of mis-handling of the line twist consequences.

Line twist are common and complicated in nature, and must be dealt as malfunction which requires skydiver's attention and fast recovery action, which many skydivers were unable to do in the past.<sup>11</sup>

### Compliance With Line Twist Recovery Procedure

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<sup>9</sup> USPA website: [www.uspa.org](http://www.uspa.org)

<sup>10</sup> RSL and MARD are two mechanisms used to separate the main canopy in an emergency and deploy the reserve parachute

<sup>11</sup> An article on [www.USPA.org](http://www.USPA.org) expands on this topic



The Investigation reviewed the actions of the Skydiver after the line twist and noticed that he was not fast enough in implementing the emergency procedures.

It was noticed that the Skydiver did not fully pull the cutaway handle to release the main parachute. The Investigation sees that it was probable that hand force that the skydiver applied to pull the cutaway handle was not enough.

As the Skydiver got close to the ground, his actions were completely irrelevant to the recovery from the line twist, it was more negative emotional reactions towards the Parachute expressing anger and disappointment. The Investigation believes that the Skydiver was not aware of the running time and his reactions were slower than it should have been in such emergency situations. Moreover, the inability of the Skydiver to pull the cutaway handle in full caused him to panic which affected his situation awareness.

The Investigation believes that skydivers need to be aware of the criticality of this situation and to react fast for recovery by using the correct technique. Awareness can be improved by promoting the recovery procedures via more efficient mechanisms.

## Conclusions

### Findings

- (a) The Club was practicing operations under a valid *Parachute Approved Organization (PAO)* issued by the GCAA.
- (b) The Skydiver held a valid USPA-C license.
- (c) The Skydiver has logged a total of 347 jumps, and the last recorded jump was on 12 December 2022. He executed jumps in the Club's premises during January and February 2023 which were not recorded in the log.
- (d) The Skydiver signed the *brief acknowledgement form* in which he declared that he understands the safety brief of the video presented by the Club.
- (e) The safety brief did not include any description about line twist, or the way to recover from it.
- (f) The Skydiver was denied boarding the aircraft in the first day flight because he did not carry his altimeter which is a necessary device for jumping.

- (g) The wind was gusting in the morning and the operation was suspended accordingly until the wind became within limits and the operation was resumed based on the weather report obtained from the NCM which provides data about the surface wind only.
- (h) During the jump, Parachute lines twisted. The Skydiver pulled the cutaway to deploy the reserve parachute but the force he exerted was not enough to deploy the reserve parachute fully.
- (i) The Skydiver actions before the impact were not in adherence with the recovery procedures.
- (j) The Skydiver impacted the ground and sustained a fatal injury.

### Causes

The Air Accident Investigation Sector determines that the cause of Parachute ground impact was the inability of the Skydiver to pull the cutaway handle. The force exerted on the handle was not enough. The downgraded Skydiver's situation awareness could not enable him to take the appropriate recovery actions at the right time.

## Safety Recommendations

The Air Accident Investigation Sector recommends that:

### Skydive Dubai

#### SR11/2023

Raise awareness about the complexity of line twist emergency, and include this emergency as a part of the safety briefs for the visiting skydivers.

**This Report is issued by:**  
**Air Accident Investigation Sector**  
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