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AAIA

Air Accident Investigation Authority

Collision with Obstacle(s) during Take-off and Landing (CTOL)

Investigation Report

BGD Dual 2 Tandem Paraglider

Ngong Ping, Ma On Shan,

Hong Kong

2 October 2023

IVR-2026-02

AAIA Investigations

Pursuant to the Hong Kong Civil Aviation (Investigation of Accidents) Regulations (Cap. 448B), the sole objective of the investigation and the Investigation Report is the prevention of accidents and incidents. It is not the purpose of the investigation to apportion blame or liability.

The Chief Inspector instigated an inspector's investigation into the accident in accordance with the provisions in Cap. 448B.

This accident Investigation Report contains information of an occurrence involving a paragliding activity at Ngong Ping, Ma On Shan in Hong Kong on 2 October 2023.

The Hong Kong Observatory, Hong Kong China Paragliding Association, International Paragliding Association, and the harness and reserve parachute manufacturer, NEO, provided assistance to the investigation team.

This Investigation Report supersedes all previous Preliminary Report and Interim Statements concerning this accident investigation.

All times in this Investigation Report are in Hong Kong Local Time unless otherwise stated.

Hong Kong Local Time is Coordinated Universal Time (UTC) + 8 hours.

Chief Accident and Safety Investigator
Air Accident Investigation Authority
Transport and Logistics Bureau
Hong Kong
April 2026

Synopsis

At about 1328 hours on 2 October 2023, a BGD Dual 2 tandem paraglider took off from Ngong Ping, Ma On Shan, where paragliding activities were frequently conducted. On board were a pilot and a passenger. Shortly after take-off, the pilot of the paraglider lost control. The paraglider subsequently impacted terrain heavily. The passenger sustained serious injuries and was transported by helicopter to the hospital for treatment.

During the investigation, the AAIA identified a safety issue regarding the proper connection of vital points between the paraglider and the occupant harnesses. This was considered a safety risk requiring timely mitigations. On 26 February 2024, AAIA issued Safety Recommendation Report SRR-2024-01, which contained Safety Recommendation SR 2024-01, to the Hong Kong China Paragliding Association and the International Paragliding Association.

The investigation team has further made two safety recommendations in this report.

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1. Factual Information

1.1. History of the Flight

- (1) At about 1328 hours on 2 October 2023, a BGD Dual 2 tandem paraglider took off from Ngong Ping, Ma On Shan, where paragliding activities were frequently conducted. On board were a pilot (referred to “Pilot” hereafter) and a passenger (referred to “Passenger” hereafter).
- (2) Shortly after take-off, the Pilot of the paraglider lost control. The paraglider subsequently impacted terrain.



Figure 1: Moment Shortly after the Paraglider Impacting the Terrain

- (3) The Passenger sustained serious injuries and was transported by a Government Flying Service (“GFS”) helicopter to the Pamela Youde Nethersole Eastern Hospital (“PYNEH”) for treatment.
- (4) Witnesses filmed various stages of the sequence of events, including pre-flight preparation, the take-off, and a brief portion of the subsequent flight.

1.2. Injuries to Persons

The Passenger suffered open fracture dislocation of the right ankle.

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

Table 1: Injuries to Persons

1.3. Damage – Paraglider

The Pilot did not cooperate with the investigation; therefore, no arrangement could be made to examine the paraglider and the associated equipment used in the accident flight.

1.4. Other Damage

No other damage was caused.

1.5. Personnel Information

1.5.1. Invitation for Investigation Interview

- (1) On 15 January 2024, AAIA initiated a telephone conversation with the Pilot to extend an invitation for an interview in accordance with Regulation 9(b) of Cap. 448B Hong Kong Civil Aviation (Investigation of Accidents) Regulations. The Pilot indicated that he would not be in Hong Kong and required to consult with legal counsel before proceeding.
- (2) On 26 January 2024, AAIA made a subsequent call to invite the Pilot to participate in an investigation interview. The Pilot declined the invitation, confirming his decision to refuse attendance at the interview and support to AAIA in this investigation.

1.5.2. General

Pilot	Male
Weight	Unknown
Licence details:	Unknown
Flying experience:	Unknown

Table 2: Pilot Information

1.5.3. Experience, Training and Qualifications

- (1) The Pilot was a member of the International Paragliding Association (IPA). He refused to disclose his paragliding qualifications, training, and experience.
- (2) There is no civil aviation legislation that prescribes paraglider pilot qualifications, training, competency and recency in Hong Kong.

1.6. Paraglider Information

- (1) A typical paraglider consists of a canopy which is inflated by the wind to form an aerodynamic wing (aerofoil) to which the pilot is suspended by a harness equipped with control lines. The inflated wing enables the paraglider to fly forward and downward. To gain height, it has to make use of rising air. It has elementary means of directional control.

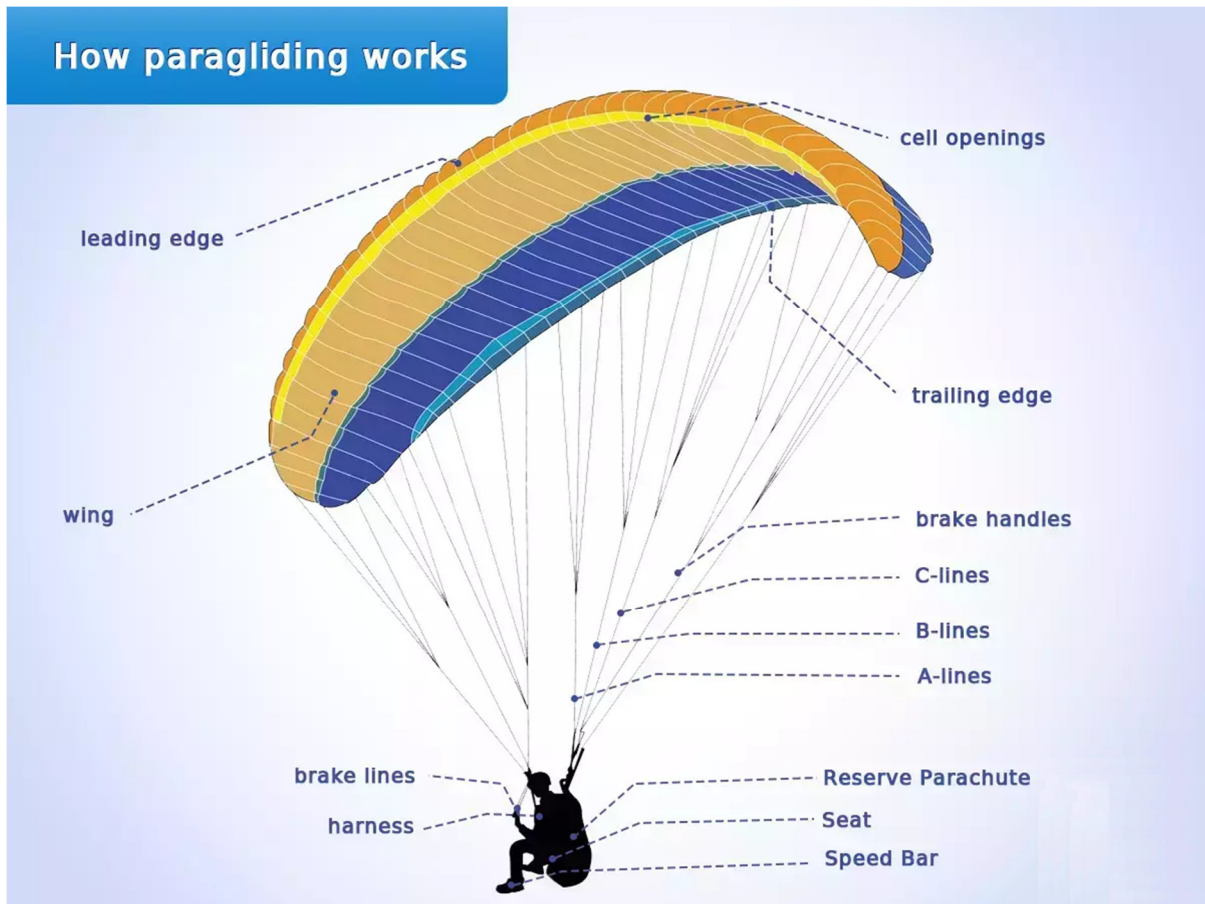


Figure 2: A Typical Paraglider

(Source: <https://antoursvietnam.com/the-history-of-paragliding-sport/>)

- (2) From leading edge to trailing edge, the lines carrying weight are typically divided into three to four rows, namely A-lines to D-lines. The A-lines are the closest to the leading edge and the D-lines are the furthest. The lines are connected to the corresponding A, B, C and D risers, through triangular metal elements called maillons. The risers are stitched together in an ear, where a karabiner connects them to the pilot's harness.
- (3) The risers are arranged in such a way that the pulling of a pulley system on the A-riser, pulls consecutively A, B, C and D risers downward and thus reduces the angle of attack of the canopy. This is called the speed system.
- (4) There is a stabilisation panel or stabilo at the two tips of the canopy. They maintain the shape and structure of the canopy. The line specially connected to the stabilo and one of the risers on each side of the canopy is called the stabilo line. This line, often marked with a bright colour, is used to clear a cravatte in a situation where the wingtip is folded up and not producing lift.

- (5) The closest line to the trailing edge is the control line (also known as the brake line or steering line). There are left and right control or brake lines. The control line goes through a pulley and connects to the control handle (also known as brake handle or toggle). The control remains within reach of the pilot's arms if he releases it by accident.

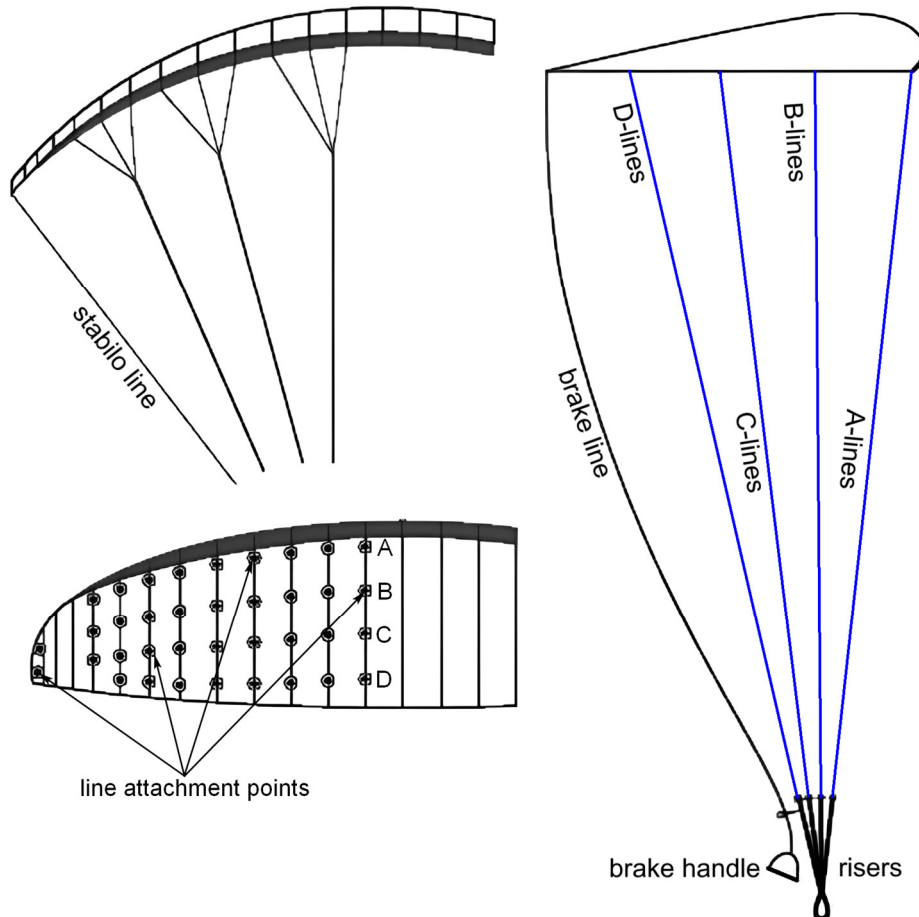


Figure 3: Paraglider Suspension Elements

(Source: https://www.skynomad.com/articles/paraglider_construction.html)

- (6) The investigation team was unable to access the paragliding equipment used during the accident flight because the pilot refused to cooperate with the investigation.
- (7) Based on the information from a member of the IPA and the videos gathered by the AAIA, the main flight equipment used by the Pilot and the Passenger were identified as:
- a BGD Dual 2 tandem paraglider of L size;
 - a NEO String harness for the Pilot;

- a Niviuk Konvers 2 harness for the Passenger to sit in;
- a NEO rescue backpack with a reserve parachute inside; and
- two NEO tandem spreaders.

(8) According to the user manual, the BGD Dual 2 tandem paraglider is certified to EN-B. An L size Dual 2 has a flat area of 41.8 m² and a weight range of 120-220 kg. It is suitable for both commercial and recreational tandem flying.



Figure 4: The Canopy of the BGD Dual 2 Tandem Paraglider Used in this Flight

(9) European Norm (EN) is a 4-level paraglider certification system, namely A, B, C and D. According to the British Hang Gliding & Paragliding Association (BHPA), EN-B paragliders are “Designed for all pilots and may be suitable for pilots under training if recommended by the manufacturer. (There is a wide range of gliders produced in this category. Some are closer to 'A' class gliders. Others are for pilots who have gained more than 30 hours mixed flying (at least ten in thermic conditions) and hold a 'Pilot' rating. B class gliders are also suitable for experienced pilots who fly less than 50 hours a year.)”¹.

¹ https://www.bhpa.co.uk/pdf/En_PG_Classes.pdf

Class	Description of flight characteristics	Description of pilot skills required (BHPA expanded version)
A	Paragliders with maximum passive safety and extremely forgiving flying characteristics. Gliders with good resistance to departures from normal flight.	Designed for all pilots including pilots under all levels of training. <i>(For all pilots especially those in their first year of flying and for experienced pilots with limited currency, for example those who fly less than 25 hours a year.)</i>
B	Paragliders with good passive safety and forgiving flying characteristics. Gliders with some resistance to departures from normal flight.	Designed for all pilots and may be suitable for pilots under training if recommended by the manufacturer. <i>(There are a wide range of gliders produced in this category. Some are closer to 'A' class gliders. Others are for pilots who have gained more than 30 hours mixed flying (at least ten in thermic conditions) and hold a 'Pilot' rating. B class gliders are also suitable for experienced pilots who fly less than 50 hours a year.)</i>
C	Paragliders with moderate passive safety and with potentially dynamic reactions to turbulence and pilot errors. Recovery to normal flight may require precise pilot input.	Designed for pilots familiar with recovery techniques, who fly "actively" and regularly, and understand the implications of flying a glider with reduced passive safety. <i>(For pilots who are Advanced Pilot rated, have several hundred hours logged (many of these in thermic conditions), have completed SIV courses, are flying 10 or more hours a month, and enjoy dealing with large asymmetric collapses etc.)</i>
D	Paragliders with demanding flying characteristics and potentially violent reactions to turbulence and pilot errors. Recovery to normal flight requires precise pilot input.	Designed for pilots well practised in recovery techniques, who fly very actively, have significant experience of flying in turbulent conditions, and who accept the implications of flying such a wing. <i>(For pilots who have been flying for many years, fly more than two hundred hours a year often in strong thermic conditions and are masters of the various SIV skills.)</i>

Figure 5: EN Classes of Paragliders Published by the BHPA

(Source: https://www.bhpa.co.uk/pdf/En_PG_Classes.pdf)

- (10) The NEO String harness used by the Pilot is certified to EN 1651 & LTF 91/09, 120 kg (maximum pilot/passenger weight up to 120 kg). It can be used for solo or tandem flying.



Figure 6: NEO String Harness Used by the Pilot

(Source: <https://www.neo-paragliders.fr/en/shop/string-3-0-1725?category=4>)

- (11) The Passenger flew with a Niviuk Konvers 2 harness and the size is unknown. It is certified to EN 1651 & LTF 91/09, 120 kg (maximum pilot/passenger weight up to 120 kg). It has an airbag impact pad.



Figure 7: Niviuk Konvers 2 Harness Used by the Passenger

(Source: <https://flybubble.com/niviuk-konvers-2>)

- (12) The Pilot carried an NEO rescue backpack with a stowed reserve parachute. It is certified to EN 1651. It was used to connect the paraglider and the harnesses of the Pilot and the Passenger through a set of spreaders.



Figure 8: NEO Flying Mode Rescue Backpack Used by the Pilot

(Source: https://www.neo-paragliders.fr/zh_CN/shop/rescue-backpack-1826)

- (13) For typical tandem paragliding, the harnesses of the pilot and passenger are attached to a pair of spreaders. The spreaders and the rescue backpack (reserve parachute) are subsequently attached to the paraglider.

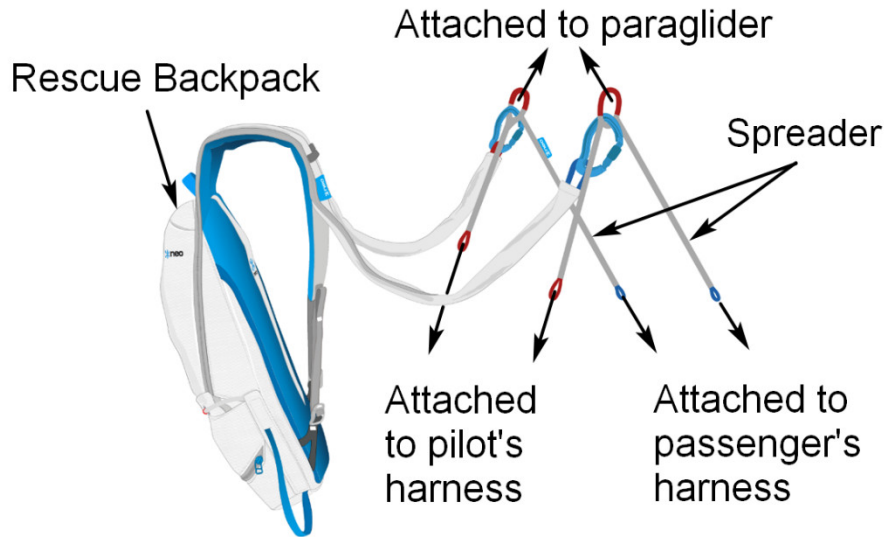


Figure 9: Harnesses and Tandem Spreaders

(Source: Based on https://www.neo-paragliders.fr/zh_CN/shop/rescue-backpack-1826)

1.7. Meteorological Factors

1.7.1. Hong Kong China Paragliding Association Site Guides

According to the site guides in the Hong Kong China Paragliding Association (HKPA) website at the time of the accident, the weather suitable for paragliding activity at Ma On Shan is as follows:

“Flyable wind direction: East (NE-E-SE)”

“Winds to look for on the HKO website are Tate’s Cairn ENE to SE force 3-4 and Sai Kung E to SE force 2-3. Never take off a paraglider in force 5 and above wind condition.”

“MA ON SHAN BECOMES UNFLYABLE IF THE WIND TURNS NORTHERLY.”

1.7.2. Weather Information from the Hong Kong Observatory

1.7.2.1. Weather Forecast for Local Aviation at 1230 hrs

- (1) At 1230 hrs on 2 October 2023, the Hong Kong Observatory (HKO) issued a weather forecast for local aviation for the period from 1300 to 2300 hrs.
- (2) According to the forecast, there was no significant weather within a 100 km radius of Hong Kong. The synopsis of the weather situation was “The northeast monsoon is affecting the South China coastal areas”.
- (3) The forecast surface wind was 10-15 knots (kt) (18-28 km/h) from the 080 degrees (east) direction.
- (4) The forecast wind at 2,000 ft was 15-20 kt (28-36 km/h) from the 110 degrees (east/southeast) direction.

1.7.2.2. Special Weather Tips

There were no Special Weather Tips issued on the date of the occurrence.

1.7.2.3. Thunderstorm Warning

There was no Thunderstorm Warning in force on the date of the occurrence.

1.7.2.4. Wind Data from Nearby Weather Stations

- (1) The wind data collected by the HKO automatic weather stations at Tate's Cairn (TC) and Sai Kung Marine East (SKG) provided a good reference for the meteorological situation in the Ma On Shan paragliding area.
- (2) The “10-minute mean wind” data between 1300 hrs and 1400 hrs of 2 October 2023 are presented in Table 3 below.

Time (in HKT)	10-minute mean wind direction (nearest 10 degree)		10-minute mean wind speed (km/h)		10-minute maximum gust (km/h)	
	TC	SKG	TC	SKG	TC	SKG
1300	110	090	21	18	27	27
1310	120	090	18	15	29	26
1320	120	090	21	18	30	26
1330	110	090	20	16	27	23
1340	110	090	22	17	27	24
1350	110	100	24	12	29	18
1400	110	090	23	14	30	21

Table 3: Mean Wind Speed and Maximum Gust Data

- (3) The data between 1300 and 1340 hrs from the TC automatic weather station indicated that the mean 10-minute mean wind speeds were 18 to 22 km/h (equivalent to wind force 3 to 4, moderate). The wind was blowing from the east and southeast (E/SE, 110 to 120 degrees). The 10-minute maximum gust was 27 to 30 km/h.
- (4) The data between 1300 and 1340 hrs from the SKG automatic weather station showed that the mean 10-minute mean wind speeds were 15 to 18 km/h (equivalent to wind force 2 to 3, light to moderate). The wind was blowing from the east (E, 090 degrees). The 10-minute maximum gust was 23 to 27 km/h.

1.7.2.5. Rainfall Rate, Cloud Base, and Visibility

- (1) The rainfall rate was zero near Ma On Shan according to the Constant Altitude Plan Position Indicator (CAPPI) radar image at 64-km range and a height of 3 km Above Mean Sea Level (AMSL) at 1330 hrs on 2 October 2023 (see Figure 10).

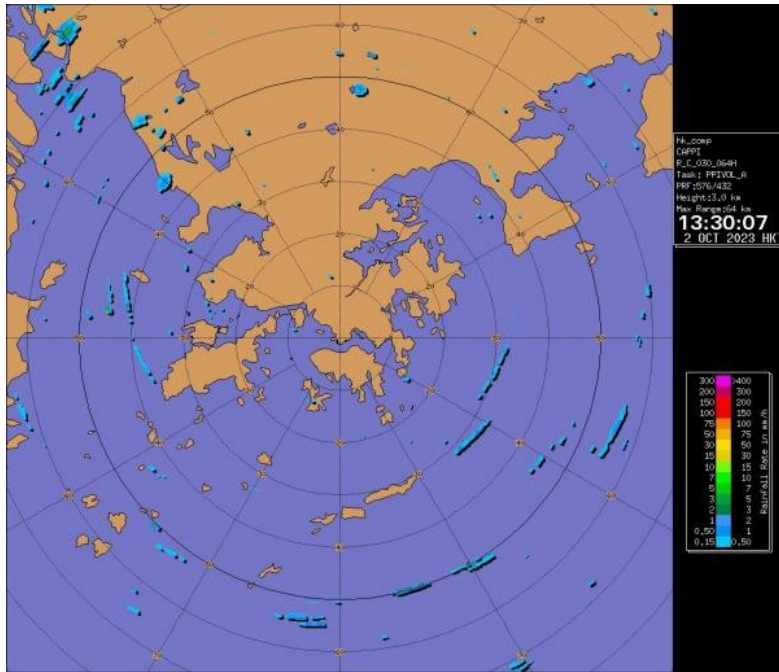


Figure 10: 3-km Radar Image of 64-km Range at 1330 Hrs on 2 October 2023

- (2) The sky was mainly cloudy at Ma On Shan according to the weather photo taken at SKG station (looking towards the northwest) at 1330 hrs on 2 October 2023. The visibility was good.

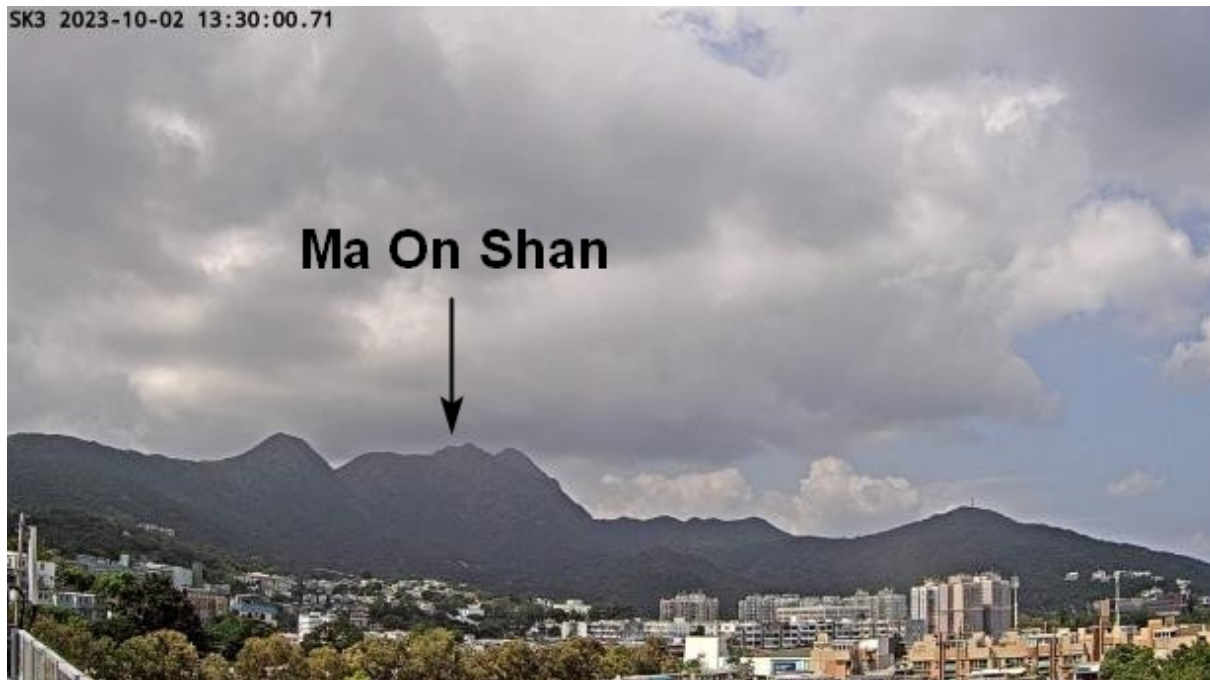


Figure 11: Weather Photo Taken at SKG Station at 1330 Hrs

1.8. Navigation Aids

Not applicable.

1.9. Communications

A witness video clip confirms that the Pilot was in possession of a handheld radio transceiver. However, its brand name, model, and preset frequencies are unknown.

1.10. Paragliding Activity Area

(1) The Ma On Shan paragliding area is within the Ma On Shan Country Park which is located in the central neck of the Sai Kung Peninsula in the eastern New Territories of Hong Kong. It is one of the locations where paragliding activities are frequently conducted. Its boundary and operating altitude can be found in Section ENR 5.5 of the Aeronautical Information Publication Hong Kong (AIP HK) published by the Civil Aviation Department (CAD).

(2)

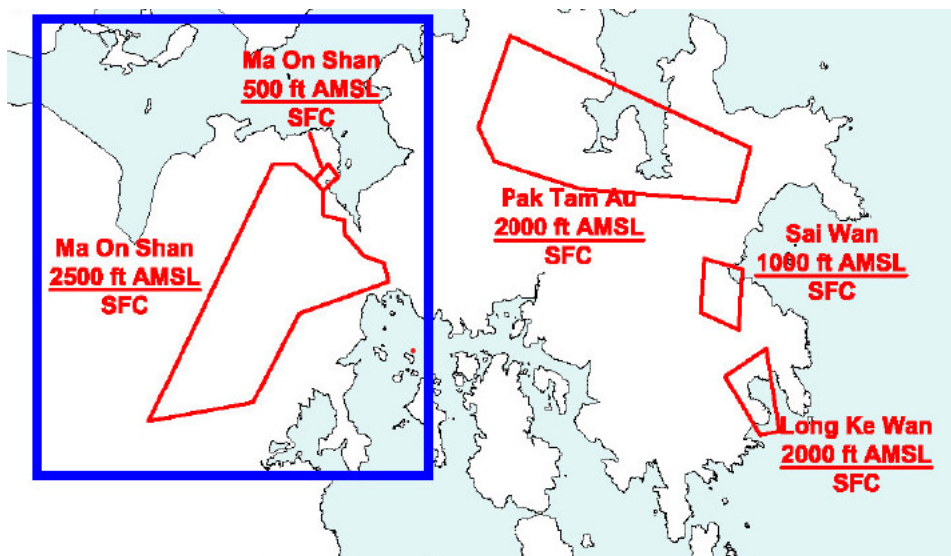


Figure 12: Ma On Shan Paragliding Area in AIP HK at the Time of the Accident

- (3) The operating altitude of the area was from the ground surface (SFC) to 500 ft (152.4 m) or SFC to 2,500 ft (762 m) AMSL, depending on the areas specified in Section ENR 5.5 of AIP HK at the time of the accident.
- (4) The take-off area of the accident flight was at a height of about 1,280 ft (390 m) AMSL.

1.11. Flight Recorders

1.11.1. Variometer

It could not be determined whether the Pilot had carried a variometer, which is capable of recording flight information such as altitude, ground speed, the vertical height gain / loss (lift / sink rate), glide ratio, height above ground level (AGL), and wind direction to a pilot. No flight data was available for analysis of the accident flight.

1.11.2. Video Recording

The accident flight was video-recorded by a couple of witnesses. These video recordings provided valuable insights into the sequence of events for the flight.

1.12. Wreckage and Impact

The post flight conditions of the paraglider, harnesses, reserve parachute, helmets, and other equipment cannot be determined due to lack of access.

1.13. Medical/Pathological Information

A copy of the Passenger's post-accident medical report was obtained from the hospital. Her right ankle was severely injured with an open fracture dislocation.

1.14. Smoke, Fire, and Fumes

Not applicable.

1.15. Survival Aspects

Not applicable.

1.16. Tests and Research

Not applicable.

1.17. Organisation, Management, System Safety

1.17.1. Civil Aviation Department

The CAD regulates civil aviation activities in Hong Kong, but there is no civil aviation legislation that prescribes paraglider pilot qualifications, training, competency and recency. However, in view of the increasing popularity of paragliding activities in Hong Kong, the CAD has published the Safety Guidance on Paragliding Activities (CAD Safety Guidance) on their website².

1.17.2. Hong Kong China Paragliding Association Limited (HKPA)

- (1) The HKPA, formerly the Hong Kong Paragliding Association Limited, was established in 1990 to promote and encourage paragliding activities. It was renamed as the Hong Kong China Paragliding Association Limited in May 2023.
- (2) The HKPA was recognised by the Sports Federation & Olympic Committee of Hong Kong, China (SF&OC) as the National Sports Association for paragliding activities in Hong Kong. Operating under the provisions of the Societies Ordinance (Cap. 151), the HKPA represents the interest of paraglider pilots and ensures the safe conduct of paragliding activities in Hong Kong.

1.17.3. International Paragliding Association (IPA)

The IPA was established as a non-profit organisation under Societies Ordinance in 2023. The Association promotes the sport of paragliding in Hong Kong and enhances members' knowledge in the use of paragliding equipment.

1.17.4. The Fédération Aéronautique Internationale (FAI)

The Fédération Aéronautique Internationale, FAI - The World Air Sports Federation (FAI) is a non-governmental and non-profit-making international organisation. It establishes rules for air sporting events and generally oversees air sports activities, including paragliding. It governs international hang gliding and paragliding through the FAI Hang Gliding and Paragliding Commission (Commission Internationale de Vol Libre – CIVL³).

² <https://www.cad.gov.hk/english/paragliding.html>

³ <https://www.fai.org/commission/civil>

1.17.5. FAI Hang Gliding and Paragliding Commission (CIVL)

- (1) The FAI Hang Gliding and Paragliding Commission (Commission Internationale de Vol Libre (CIVL) has been a permanent Commission of the FAI since 1975. CIVL is to exercise its executive powers delegated from the FAI to administer hang gliding and paragliding, including flight safety, sanctioned competitions, record attempts, training programmes, environmental issues, badges, and awards.
- (2) The CIVL creates and promotes international training standards for all aspects of hang gliding and paragliding, such as competition, towing, and tandem flying. For paragliding, the standards are published in CIVL SafePro Para – Recommended Safety Proficiency Standards For Paragliding⁴.

1.17.6. Association of Paragliding Pilots and Instructors (APPI)

- (1) APPI is an international non-profit-making association founded in 2009 and is based in Switzerland. It develops worldwide and united education standards and systems with consistent quality for paragliding and powered paragliding pilots. APPI is also one of the authors of the CIVL SafePro Para training standards.
- (2) There are five levels of training for leisure pilots, from elementary to advanced, namely APPI 1 Discover, APPI 2 Explore, APPI 3 Pilot, APPI 4 Progress, and APPI 5 Advanced Pilot.
- (1) For professional pilots, there are two levels of tandem flying training, from low to high, Non Commercial Tandem and Pro Tandem. There are also three levels of instructor training, from Assistant Instructor, Instructor, to Master Instructor.

1.18. Additional Information

1.18.1. Tandem Paragliding

- (1) Tandem paragliding is an adventure sport that a certified pilot⁵ and a passenger sharing a single paraglider wing. It allows individuals, who could be solo student paragliding pilots or passengers without prior knowledge, experience, and training, to enjoy air experience flights and appreciate the control of a paraglider.

⁴ https://www.fai.org/sites/default/files/civil/documents/safepro_para_2024.pdf

⁵ Refer to Footnote 10 on page 35.

- (2) The pilot sits at the back and manages all technical aspects, such as safety and control, weather checks, navigation, and emergency protocols with the passenger sitting in front. Passengers only need to follow instructions from their pilots.
- (3) Both pilot and passenger sit in their own harnesses. The pilot's harness usually contains the large tandem reserve parachute, which is connected to the dedicated attachment point on the spreader.
- (4) To hook up both the pilot and the passenger to the wing, spreaders are required. These are extra pieces of webbing, connected to the risers, which split in an upside-down Y shape. The passenger is connected to one pair of the front loops of the spreader. Depending on the passenger's weight, the first or second loop is used to obtain the right balance. The pilot hooks into the rear pair of loops. The risers are connected to the middle loops on the spreaders (see Figure 13).

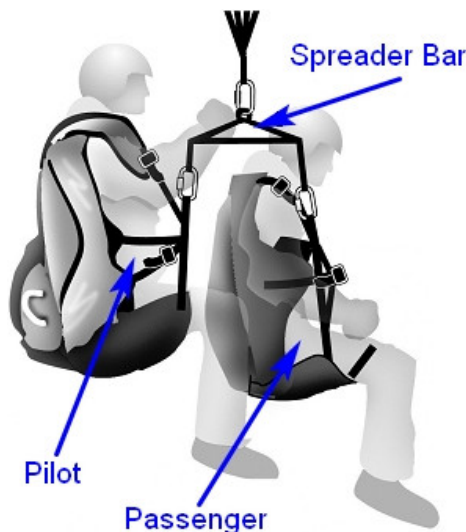


Figure 13: Tandem Paragliding Harness Setup

(Source: Based on BHPA Dual Flying Factsheet Edition 3.1)

1.18.2. The Passenger's Statement

1.18.2.1. Pilot Briefing to Passenger

- (1) The Passenger advised the investigation team that she did not have prior experience of paragliding before the accident flight. She advised that the Pilot had not provided her with any instructions or explanations on the take-off procedures, flight arrangements, or safety precautions or rules before take-off. The Pilot did not communicate with the Passenger before and after take-off. Before take-off, he focused on talking to a group of persons nearby. The video evidence in AAIA's possession verified the passenger's recollection of events.

- (2) The Passenger also mentioned that the Pilot had explained to her the theory of paragliding in a restaurant a few days before the accident flight, but the contents did not cover any safety precautions, equipment, or any specific operational matters related to tandem flying.

1.18.2.2. Pilot Qualifications

The Passenger advised that she had found out after the accident that the Pilot was not qualified to conduct paragliding flight training or instruction. Since the Pilot's flying experience and qualifications could not be determined, the investigation team was unable to verify this piece of information.

1.18.3. CAD Safety Guidance on Tandem Paragliding

- (1) The Introduction paragraph of the CAD Safety Guidance states that “...To ensure safety, members of the public who are interested in participating in paragliding activities (paid services) (e.g. instructional flying or tandem flying) shall choose the relevant eligible person(s) or organization(s) from the List of Permit Holders.” It also provides a link to the current list of eligible person(s) or organization(s) who are permitted by the CAD to operate non-scheduled services for hire or reward (paragliders), including tandem paragliding.
- (2) Section 5 of the Guidance provides the following information on tandem paragliding:

“5 Tandem paragliding

Tandem paragliding entails additional operational considerations and poses additional safety risks. Apart from the additional safety measures that must be taken by the paraglider pilot and/or operator in association with the tandem activity (such as the conduct of a more robust risk assessment of the additional operational and third party (including passengers) risks involved, attainment of appropriate pilot qualification and competency required for such tandem activities, etc.), paraglider pilots shall carry adequate insurance coverage for the passengers for the activity. Paraglider pilots shall also ensure that the passengers are fully aware of the risks involved in the activity.

If the tandem paragliding activities may involve hire or reward, please also refer to the legal requirements as highlighted in Paragraph 6.”

1.18.4. FAI IPPI Card

- (1) The International Pilot Proficiency Identification (IPPI) Card was introduced by the FAI in 1992. It registers the skill (rating) level attained by a paragliding pilot, as determined by the national/territory associations

issuing the card. It therefore provides a standard reference by which all national/territory paragliding rating programmes may be compared. The IPPI system works by converting a pilot's national/territory rating into the equivalent SafePro Para rating by which pilots' skills, experience level, and proficiency can be easily identified and verified. A list of countries/territories recognising the IPPI Card, including the Hong Kong Special Administrative Region, is published on the CIVL website⁶.

- (2) The IPPI Card can be issued by the individual national/territory associations on behalf of the FAI, CIVL designated representative (usually a federation), or any association approved by CIVL. The IPPI Card is valid only together with a current national/territory licence or rating card.

1.18.5. APPI Paragliding Education Standard and System

- (1) There are five levels of training for leisure pilots, from elementary to advanced, namely APPI 1 Discover, APPI 2 Explore, APPI 3 Pilot, APPI 4 Progress, and APPI 5 Advanced Pilot.
- (2) There are also five levels of training for professional pilots, namely Non-commercial Tandem, Pro Tandem, Assistant Instructor, Instructor, and Master Instructor.
- (3) The Non-commercial Tandem level is the first step towards APPI professional qualifications. This level of training covers knowledge about tandem operation, procedures, gear, and attitude. Pilots under training will have a minimum of 10 tandem flights as a pilot under the direct control of an APPI instructor.
- (4) To enrol in a tandem pilot course, a pilot must be a certified APPI 5 advanced pilot. If not, the pilot should be able to prove that he fulfils all APPI 5 advanced pilot requirements (including: experience in paragliding of more than one year, 200 flights, 100 hours on 10 different flying sites, advanced SIV⁷, cross-country, etc.) and pass a preliminary theory test.
- (5) The APPI and the FAI play distinct yet complementary roles in global recognition of pilot certification, education and training, and joint efforts in safety and advocacy.

⁶ <https://www.fai.org/page/recognition-and-use>

⁷ SIV stands for 'Simulation d'Incident en Vol' and means simulating unstable situations in paragliding flight. SIV training is for pilots to learn about the way their particular canopy handles and how to make the correct control inputs in unstable situations, progressively building up to more complicated manoeuvres.

1.18.6. Tandem Paragliding Briefing for Passenger

- (1) In APPI Tandem training, one of the essential topics is how to provide a briefing to passengers explaining the safety aspects and flight process before take-off and during the flight in an effective and concise manner.
- (2) Prior to take-off, tandem pilot will explain to the passenger in detail what will occur prior to a flight. The briefing should adapt to conditions, such as weather, terrain, and associated techniques a tandem pilot will use.
- (3) The briefing typically covers:
 - (a) take-off procedures,
 - (b) what a passenger should do and should not do during the flight,
 - (c) how tandem pilots expect their passengers to respond to their commands (such as “run fast”, “don’t sit”, “lean forward”, etc.),
 - (d) an estimate of how long the flight will take,
 - (e) the procedure to follow in the event of an emergency situation such as a line break, etc.
- (4) A briefing example used in APPI Tandem training is shown below in Figure 14.

Briefing Example light wind, alpine take off

there are 3 important things to know for take-off: 1 you need to run, 2 you need to run, 3 you need to...run

this looks like a joke but we will have 3 stages in our take off

-1: when I tell you go, you... (walk fast, run smoothly, run fast... depending on gear, conditions, passenger) and you will feel like a brake, this is glider's inflation

-2: keep going ahead with strength, then you may feel you are being lifted, we are not flying yet, stay standing up and keep on going even if your feet do not touch the ground for a moment

-3: Finally it gets easy to go forward and the wing is lifting you: accelerate, run fast, look far, huge steps

-never sit, until I say you can sit, even if your feet don't touch the ground,

-never stop unless I tell you « stop ».

so can you repeat what we will do ?

Figure 14: Example of Tandem Pilot Briefing to Passenger

(Source: Tandem Workshop Material, Kamshet, India, 17th – 25th January 2024)

- (5) Tandem pilot to passenger briefing is an evaluation item in the APPI Tandem Workshop examination.

1.18.7. Control Lines and Handles of Paraglider

- (1) The control lines mentioned in paragraph 1.6 (2) are used to alter the shape of the canopy and thus increase the camber of the aerofoil, and adjust the speed, shifting weight, and also help in flare during landing.
- (2) Increasing the angle of attack of the aerofoil (canopy) increases the lift. Drag is also increased to allow slowing down of the paraglider. Basic steering is achieved by gently pulling down the control lines on the side of the direction a pilot wishes to turn.
- (3) Speed is adjusted by pulling both control handles simultaneously: typically, completely off for best-glide speed; one-quarter to one-third on for minimum-sink speed, and fully on to produce a deliberate stall at the last moment for a light-wind landing.
- (4) It is therefore important for a pilot to hold the control handles in his hands to maintain control of the paraglider at critical stages, such as take-off.
- (5) A caution in the APPI Pilot Manual states that “Releasing the brake controls immediately after take-off in order to sit comfortably in the harness, is frequently linked to risk of accident in case of asymmetric collapse. For this reason wait until there is a sufficient distance from the slope. Never let go the two brakes, you should be able to sit comfortably by lifting your knees and sitting back, if necessary keep both brakes in one hand above the head and keep looking ahead to stay on a good trajectory, use the free hand to sit comfortably.”
- (6) In the appendix⁸ in FAI IPPI Card Information (February 2015), release of control handles during take-off is identified as one of the poor techniques.

1.19. Useful or Effective Investigation Techniques

Not applicable.

⁸ The Para Pro - A Paragliding Safety and Training Analysis, by Stein Arne Fossum

2. Safety Analysis

The Safety Analysis provides a detailed discussion of the safety factors identified during the investigation, providing the evidence required to establish the findings, causes, contributing factors and the safety recommendations.

2.1. Paragliding Equipment

The EN-B tandem paraglider used in the accident flight is designed for dual-rated (solo and tandem) pilots. The video recordings of the paragliding equipment indicated that the equipment was serviceable; however, the investigation team was unable to examine or test the equipment because the Pilot refused to cooperate with the investigation.

2.2. Connections between Paraglider and Harnesses

- (1) A detailed review of the video recordings revealed that the left spreader was properly attached to the harnesses of both the Pilot and the Passenger (Figures 15 and 16).

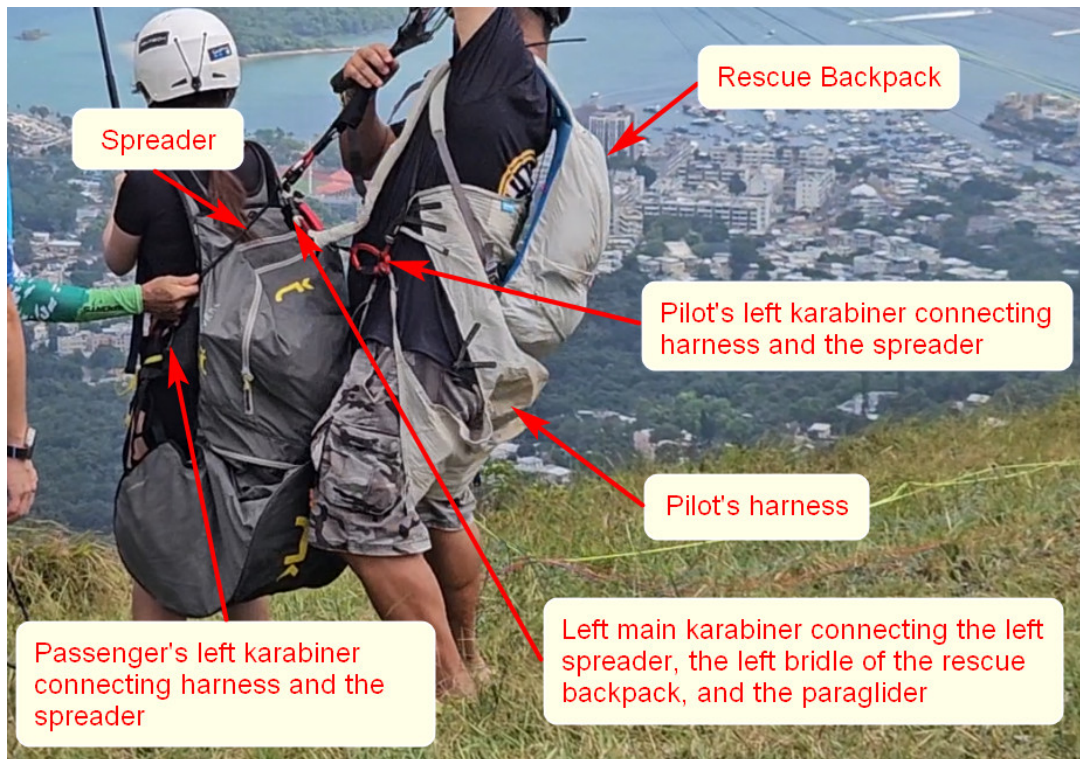


Figure 15: Pilot's and Passenger's Connections on the Left-hand Side



Figure 16: Spreader and Harnesses Connection on the Left-hand Side

- (2) Under closer observation, it was evident that on the right-hand side the Pilot's karabiner (blue colour) on his harness was not attached to the right spreader (red colour) (Figure 17).

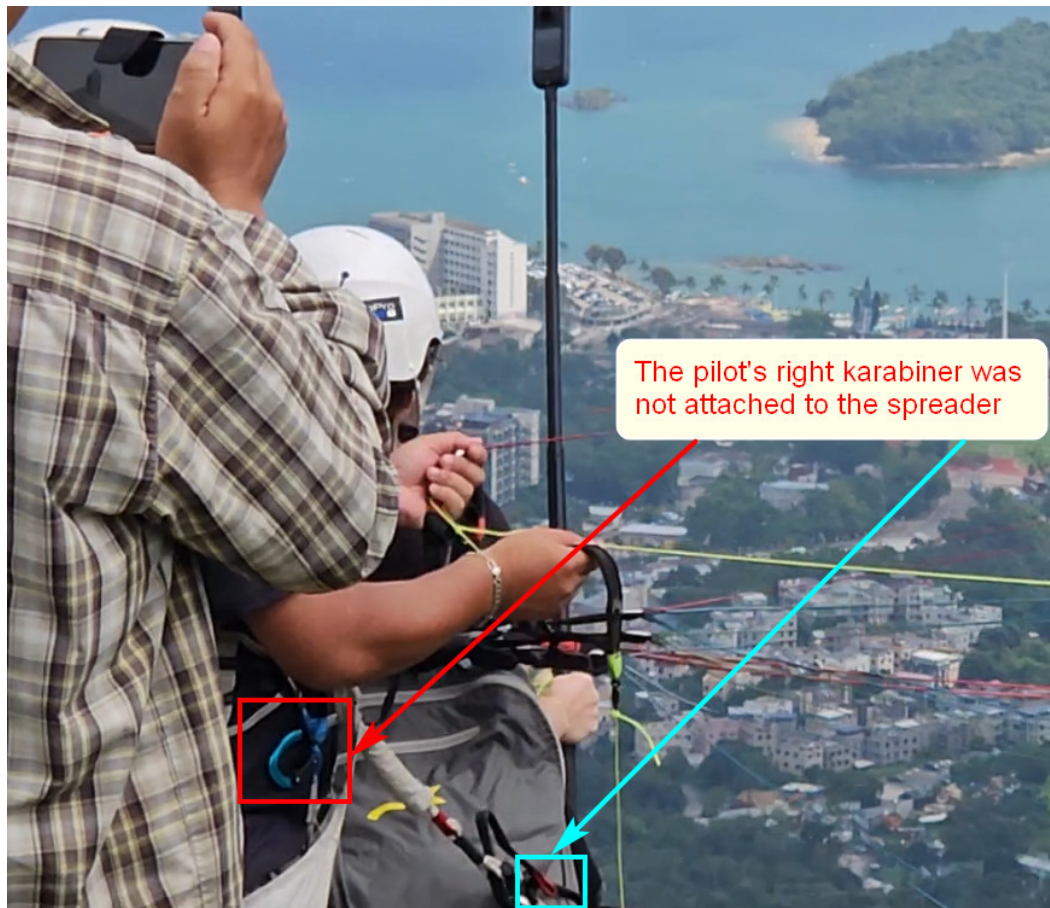


Figure 17: Pilot's Harness and Spreader Connections on the Right-hand Side

- (3) In addition, it was found on the right-hand side that although the rescue backpack was attached to the main karabiner, the bridle of the Pilot's harness was incorrectly routed across that of the rescue backpack (Figure 18).



Figure 18: Bridle of Pilot's Harness Crossing That of the Rescue Backpack

2.3. Flight Analysis

- (1) The connections of the Passenger's harness were not clearly visible because of the camera angle in the video recordings before take-off. However, the short flight after take-off provided evidence that the Passenger's harness was attached to the spreader and hence the paraglider.
- (2) Immediately after take-off, the Pilot released the right control handle and pushed the back of the Passenger's harness with his right hand, probably intending to make the Passenger sit better in her harness (Figure 19).

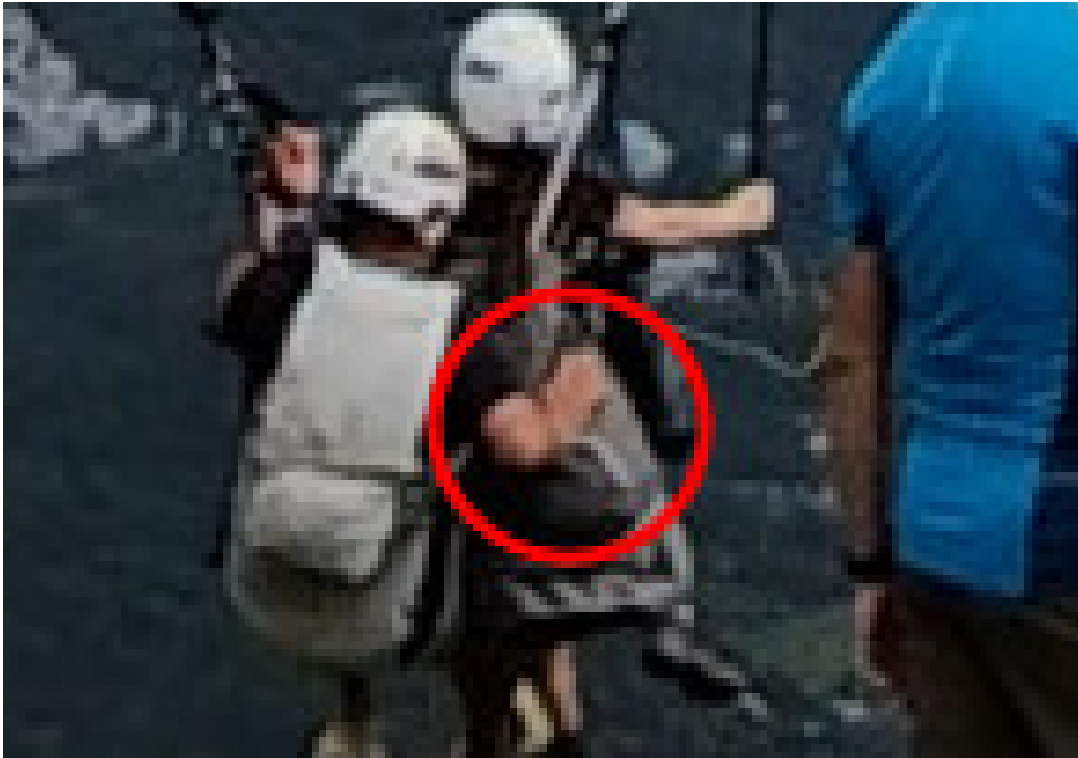


Figure 19: Pilot Pushing Passenger's Harness with Right Hand

- (3) At the same time, his left hand was still holding the left control handle, and the shape of the left trailing edge of the canopy was altered by the corresponding control line (Figure 20).



Figure 20: Pilot Still Holding Left Control Handle

- (4) Shortly after that, he also released the left control handle (Figure 21).



Figure 21: Pilot Released Left Control Handle

- (5) Almost at the same time, the video revealed that the Pilot suddenly descended below the Passenger with only the left-hand side of his harness remaining attached to the spreader. Consequently, the Pilot lost control of the paraglider (Figure 22).



Figure 22: Pilot Losing Control of the Paraglider

- (6) Because of the uneven distribution and shifting of the total weight and the loss of pilot control, the paraglider started to bank to the left, causing the canopy to gradually deform and transition from its normal curved shape into an M-shape configuration (see Figure 22).
- (7) It could be observed in the video recording that the Pilot attempted and managed to re-grasp the left control handle. Almost at the same time, the paraglider collided with terrain (see Figure 23).



Figure 23: Paraglider Collision with Terrain

2.4. Pre-flight Check on Equipment

- (1) According to APPI's Tandem Workshop notes, it is crucial for pilots to perform a final check on the following vital points:
 - (a) *Passenger's leg-straps;*
 - (b) *Passenger's karabiners (harness to spreaders);*
 - (c) *Main karabiners (spreaders to paraglider);*
 - (d) *Pilot's karabiners (harness to spreaders);*
 - (e) *Pilot's leg-straps;*
 - (f) *Symmetry of trims; and*
 - (g) *Freedom of brakes lines.*
- (2) There may be variations in the specific descriptions of these vital points, the underlying safety principles remain consistent – ensuring the correct connection of all vital points of a paraglider and the harnesses. Any overlook in this regard can significantly compromise the handling characteristics and overall safety of the paraglider during flight.
- (3) The investigation team strongly advocated for the need to reiterate the utmost importance of conducting thorough pre-flight equipment checks to all participants of paragliding in Hong Kong through the HKPA and the IPA.

2.5. Immediate Release of Control Handles during Take-off

- (1) The FAI/CIVL paragliding standards for safety and training highlighted that release of control handles in order to get into the harness during take-off was one of the poor take-off techniques.
- (2) After lifting off from the ground, a pilot should make gradual control adjustments to ensure that the canopy does not retard behind him. If he applies too much control, he should gently correct the input, as rapidly releasing the control handle may cause a forward surge of the canopy, resulting in a quick dive pendulum effect.
- (3) It is therefore essential for pilots to maintain effective control of the canopy until there is a sufficient terrain clearance and gain of some altitude, before releasing the control handles and getting into or adjusting his harness or instrumentation.
- (4) Release of control handles during take-off is one of the most risky habits, especially when flying in thermic conditions or low to the ground. It is because unexpected collapses of canopy or changes in the air mass can occur. The APPI also cautioned pilots that releasing the control handles immediately after take-off is frequently linked to risk of accident in case of asymmetric canopy collapse.
- (5) The investigation team strongly advocated for the need to reiterate the utmost importance of maintaining effective control of the paraglider with the control handles during take-off to all participants of paragliding in Hong Kong through the HKPA and the IPA.

2.6. Pilot's Qualifications and Experience

- (1) Since the Pilot declined the AAIA invitations for an interview, his flying qualifications and experience could not be assessed. The investigation team was unable to determine whether his qualifications and experience was a significant factor in this accident.
- (2) The Pilot was not on the CAD "List of Permit Holders to Operate Non-Scheduled Services for Hire or Reward (Paragliders)" at the time of the accident flight.

2.7. Weather

The data between 1300 and 1340 hrs collected at the TC and SKG automatic weather stations indicated that the mean wind direction and speed (and hence the wind force)

at the time of the accident flight was within the range outlined in the best practice guide of the paragliding community. In addition, the weather photos and data indicated that the sky was only mainly cloudy at Ma On Shan and the visibility was 5 km or more. Therefore, the investigation team considers that the weather conditions were not a contributing factor in the accident.

2.8. Perspective of Passenger

2.8.1. Previous Knowledge on Paragliding and Pilot Ratings

Members of the public, who wish to experience tandem paragliding, may lack prior knowledge of the sport, including an understanding of tandem pilot ratings, safety procedures, operational safety risks, and other aspects of flight. Therefore, to ensure their own safety, it is crucial for them to know how to assess pilots with the right qualifications and experience. This is particularly crucial for tandem paragliding activities that do not involve hire or reward, such as recreational rides offered by friends or voluntary third parties.

2.8.2. Assessing Tandem Pilots with the Right Qualifications and Experience

- (1) Since the public might not know how to assess the qualifications and experience of tandem pilots, they may try to refer to the CAD Safety Guidance website, which offers official paragliding information in addition to resources provided by the HKPA and the IPA.
- (2) The CAD Safety Guidance emphasises that tandem paraglider pilots should have appropriate qualifications and competencies. For those who intend to offer tandem paragliding services for hire or reward, they are required to provide their corresponding tandem qualifications attained⁹, along with other supporting documents, in their application to CAD. Those permit holders who can provide tandem paragliding services for hire or reward are listed in the CAD Safety Guidance website. Other paraglider pilots are advised to refer to the safety recommendations published on the CAD Safety Guidance.
- (3) In order to benefit the public involved in all tandem paragliding activities, not just those for hire or reward services, the investigation team considers that information about tandem pilot qualifications and competency be also made available on the CAD Safety Guidance website. This additional layer of consideration will prompt and help the public assess the suitability of the pilots, regardless of whether hire and reward are involved.

⁹ Note 5 of CAD form DCA 122B (Jan 2023) - Application for Permission to Operate Non-Scheduled Services for Hire or Reward (Paragliders)

- (4) Taking account of the above considerations, the CAD enhanced the CAD Safety Guidance webpage to reflect these updates¹⁰.

2.8.3. Briefing Passenger by Tandem Pilot

- (1) To ensure the safety of both tandem pilot and passenger, it is crucial for tandem pilots to give passengers an informative briefing about the flight plan, the region, commands for the movements to be made during the departure, the circumstances encountered during the flight and the landing, and how the tandem pilot expects their passenger to respond. A tandem pilot should also be open to feedback and suggestions from a passenger.
- (2) An effective pre-flight briefing is crucial to confirm the tandem pilot and the passenger have a shared understanding of the operation, including safety equipment, safety procedures, communication protocols, and actions in the event of an emergency.
- (3) The investigation team considers that the safety of the general public participating in paragliding operations would be enhanced if the CAD Safety Guidance website also highlighted the requirement for tandem pilots to brief passengers thoroughly before flight.
- (4) Taking account of the above considerations, the CAD enhanced the CAD Safety Guidance webpage to reflect these updates¹⁰.
- (5) There is also a need to re-emphasise the importance of tandem pilots briefing passengers effectively before and during the flight through the HKPA and the IPA.

¹⁰ Section 5 (Tandem Paragliding) of the CAD Safety Guidance webpage was reviewed and updated on 28 February 2025. A reference was added regarding the attainment of appropriate pilot qualification and competency required for such tandem activities, such as those issued by the Association of Paragliding Pilots and Instructors (APPI), British Hang Gliding and Paragliding Association (BHPA), Sports Aviation Federation of Australia (SAFA), etc., which have an established pilot rating system. Tandem paraglider pilots shall also ensure that the passengers are fully aware of the emergency procedures by providing a detailed pre-flight briefing.

3. Conclusions

3.1. Findings

From the evidence available, the following findings are made with respect to this occurrence. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

- (1) Several video recordings were taken by witnesses, documenting various stages of the pre-flight preparation, the take-off, and a brief portion of the subsequent accident flight. [1.1 (4)]
- (2) The Pilot was a member of the International Paragliding Association (IPA). He refused to disclose his paragliding qualifications, training, and experience. [1.5.3 (1)]
- (3) There is no civil aviation legislation that prescribes paraglider pilot qualifications, training, competency and recency in Hong Kong. [1.5.3 (2)]
- (4) The take-off area was within the boundaries of the Ma On Shan paragliding area as stipulated in the AIP HK published by the CAD. [1.10 (1)]
- (5) No flight data was available for analysis of the accident flight. (1.11.1)
- (6) The Passenger advised the investigation team that the Pilot had not provided her with a pre-flight or in-flight briefing. [1.18.2.1 (1)]
- (7) The Passenger advised the investigation team that she had found out after the accident that the Pilot was not qualified to conduct paragliding training or flight instruction. Since the Pilot's flying experience and qualifications could not be determined, the investigation team was unable to verify this piece of information. (1.18.2.2)
- (8) The CAD had published Safety Guidance on Paragliding Activities on their website, including safety guidance on tandem paragliding. [1.18.3 (1) and (2)]
- (9) The APPI education system defines various levels of training for leisure pilots and professional pilots. [1.18.5 (1) and (2)]
- (10) In APPI Tandem training, one of the essential topics is how to provide a briefing to passengers explaining the safety aspects and flight process

before take-off and during the flight in an effective and concise manner. [1.18.6 (1)]

- (11) The EN-B tandem paraglider used in the accident flight is designed for dual-rated (solo and tandem) pilots. The video recordings of the paragliding equipment indicated that the equipment was serviceable; however, the investigation team was unable to examine or test the equipment because the Pilot refused to cooperate with the investigation. (2.1)
- (12) The left side of the Pilot's harness was correctly attached to the spreader while the right side of the harness was not. [2.2 (1) and (2)]
- (13) The Passenger's harness was appropriately attached to the spreader and hence the paraglider. [2.3 (1)]
- (14) Immediately after take-off, the Pilot released the right control handle and pushed the back of the Passenger's harness with his right hand, probably intending to make the Passenger sit better in her harness. [2.3 (2)]
- (15) At the same time, the Pilot's left hand was still holding the left control handle, and the shape of the left trailing edge of the canopy was altered by the corresponding control line. Shortly after that, he also released the left control handle. [2.3 (3) and (4)]
- (16) The Pilot suddenly descended below the Passenger with only the left-hand side of his harness remaining attached to the spreader. Consequently, the Pilot lost control of the paraglider. [2.3 (5)]
- (17) Because of the uneven distribution and shifting of the total weight and the loss of pilot control, the paraglider started to bank to the left and eventually collided with the terrain. [2.3 (6)]
- (18) The investigation team strongly advocated for the need to reiterate the utmost importance of conducting thorough pre-flight equipment checks to all participants of paragliding in Hong Kong through the HKPA and the IPA. [2.4 (3)]
- (19) The FAI/CIVL paragliding standards or safety and training document highlighted that release of control handles in order to get into harness during take-off was identified as one of the poor take-off techniques. [2.5 (1)]
- (20) The investigation team strongly advocated for the need to reiterate the utmost importance of maintaining effective control of the paraglider with the control handles during take-off to all participants of paragliding in Hong Kong through the HKPA and the IPA. [2.5 (5)]

- (21) The weather conditions were not a contributing factor of the accident. (2.7)
- (22) It is important for the public to know how to assess if paraglider pilots have appropriate qualifications and experience. This is particularly important for tandem paragliding activities that do not involve hire or reward, such as recreational rides offered by friends or voluntary third parties. (2.8.1)
- (23) The CAD Safety Guidance emphasises that tandem paraglider pilots should have appropriate qualifications and competencies. For those who intend to offer tandem paragliding services for hire or reward, they are required to provide their corresponding tandem qualifications attained, along with other supporting documents, in their application to CAD. Those permit holders who can provide tandem paragliding services for hire or reward are listed in the CAD Safety Guidance website. Other paraglider pilots are advised to refer to the safety recommendations published on the CAD Safety Guidance. [2.8.2 (2)]
- (24) In order to benefit the public involved in all tandem paragliding activities, not just those for hire or reward services, the investigation team considers that information about tandem pilot qualifications and competency be also made available on the CAD Safety Guidance website. Taking into account these considerations, the CAD updated the CAD Safety Guidance website. [2.8.2 (3) and (4)]
- (25) The investigation team considers that the safety of the general public participating in paragliding operations would be enhanced if the CAD Safety Guidance website also highlighted the requirement for tandem pilots to brief passengers thoroughly before flight. Taking account of the above considerations, the CAD enhanced the CAD Safety Guidance webpage to reflect these updates. [2.8.3 (3) and (4)].
- (26) There is also a need to re-emphasise the importance of tandem pilots briefing passengers effectively before and during the flight through the HKPA and the IPA. [2.8.3 (5)]

3.2. Cause

The uneven distribution and shifting of the total weight of the Pilot and the Passenger because of the improper attachment between the right side of the harness and the spreader, and the pilot's inappropriate take-off technique, compromised the controllability of the paraglider. The Pilot subsequently lost control of the paraglider, which resulted in a collision with terrain. [3.1 (14), (16), and (17)]

4. AAIA Safety Recommendation Report

- (1) When a safety issue is identified at any stage of the investigation, AAIA issues Safety Recommendation Report to the relevant organisation(s) to recommend preventative action that has to be taken promptly to enhance aviation safety.
- (2) During the investigation, AAIA identified a safety issue regarding the crucial importance of ensuring the proper connection of all vital points of a paraglider and the harnesses during the pre-flight check, which should be addressed in a timely manner. On 26 February 2024, AAIA issued Safety Recommendation Report SRR-2024-01, which contained Safety Recommendation SR 2024-01, to the HKPA and the IPA.

4.1. Safety Recommendation SR-2024-01

It is recommended that the Hong Kong China Paragliding Association and the International Paragliding Association to re-emphasize the crucial importance of ensuring proper connection of all vital points of a paraglider and the harnesses during the pre-flight check to all participants of paragliding in Hong Kong. This is vital to prevent any potential separation between occupants and the paraglider while in flight.

Safety Recommendation Owner: The Hong Kong China Paragliding Association and the International Paragliding Association

5. Safety Actions Already Implemented

5.1. Safety Actions on Implementation of Safety Recommendation SR-2024-01

5.1.1. Safety Actions Taken by the HKPA

- (1) In November 2023, the HKPA disseminated two reminders to members by using social media to reiterate the importance of the pre-flight check, including the proper connection of all vital points of a paraglider and the harnesses during the pre-flight inspection.
- (2) In February 2024, the HKPA highlighted the accident for discussion among members in a regular safety meeting. The importance of the pre-flight check was also restated in the meeting.

5.1.2. Safety Actions Taken by the IPA

The IPA disseminated a reminder to members by social media that they must recheck all safety buckles and other items before take-off to ensure they are functioning properly. They should also take good care of their personal paragliding equipment and pay attention to safety. The safety of the general public participating in paragliding operations would be enhanced.

6. Safety Recommendations

6.1. Safety Recommendation SR-2026-01

It is recommended that the Hong Kong China Paragliding Association (HKPA) and the International Paragliding Association (IPA) to re-emphasize the importance of maintaining effective control of the paraglider with the control handles during take-off to all pilots in Hong Kong. [3.1 (20)]

Safety Recommendation Owner: The Hong Kong China Paragliding Association; the International Paragliding Association

6.2. Safety Recommendation SR-2026-02

It is recommended that the Hong Kong China Paragliding Association (HKPA) and the International Paragliding Association (IPA) to re-emphasize the importance of briefing passengers properly before and during flight to all qualified tandem pilots in Hong Kong. [3.1 (26)]

Safety Recommendation Owner: The Hong Kong China Paragliding Association; the International Paragliding Association

7. General Details

7.1. Occurrence Details

Date and time:	2 October 2023 at 1328 hours
Occurrence category:	Accident
Primary occurrence type:	Collision with Obstacle(s) during Take-off and Landing (CTOL)
Location:	Ngong Ping, Ma On Shan, Hong Kong
Position:	22° 23' 30.3" N, 114° 15' 10.5" E

7.2. Pilot Details

Licence details:	Nil
Flying experience:	Unknown

7.3. Aircraft Details

Manufacturer and model:	BGD Dual 2 Tandem Paraglider, L size	
Serial number:	Unknown	
Year of Manufacture:	2023	
Type of Operation:	Ngong Ping, Ma On Shan, Hong Kong	
Departure:	Ngong Ping, Ma On Shan, Hong Kong	
Destination:	BGD Dual 2 Tandem Paraglider	
Persons on board:	Crew – 1	Passengers – 1
Fatalities:	0	
Injuries:	1	
Aircraft damage:	Unknown	

8. Abbreviations

AAIA	Air Accident Investigation Authority
AGL	Above ground level
AIP HK	Aeronautical Information Publication Hong Kong
AMSL	Above Mean Sea Level
APPI	Association of Paragliding Pilots and Instructors
BHPA	British Hang Gliding & Paragliding Association
CAD	Civil Aviation Department
CAD Safety Guidance	CAD Safety Guidance on Paragliding Activities
Cap. 448B	Hong Kong Civil Aviation (Investigation of Accidents) Regulations
CAPPI	Constant Altitude Plan Position Indicator
CIVL	Commission Internationale de Vol Libre (The FAI Hang Gliding and Paragliding Commission)
EN	European Norm
FAI	The Fédération Aéronautique Internationale, FAI - The World Air Sports Federation
ft	Feet
GFS	Government Flying Service
HKO	Hong Kong Observatory
HKPA	Hong Kong China Paragliding Association
HKPF	Hong Kong Police Force
hrs	Hours
IPA	International Paragliding Association
IPPI	The International Pilot Proficiency Identification
km	Kilometre
kt	Knot
m	Metre

min	Minute
PYNEH	Pamela Youde Nethersole Eastern Hospital
SF&OC	Sports Federation & Olympic Committee of Hong Kong, China
SFC	Ground surface
SKG	Sai Kung Marine East
TC	Tate's Cairn
UTC	Coordinated Universal Time

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