الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY

United Arab Emirates

Air Accident Investigation Sector

Aviation Safety Study

[Research Paper: SRP/0001/2020]

Parasailing Activities in the United Arab Emirates

Safety Studies are conducted in compliance with the *Air Accident Investigation Regulations* and conformance with *Annex 13* to the Convention on International Civil Aviation. The final product of a Safety Study is a Research Paper, which may contain safety recommendations addressed to the appropriate organizations. Research Papers are made public on the website.

EXECUTIVE SUMMARY

On 9 November 2019, at about 1400 LT of the United Arab Emirates, two boats operated by Kasir Al Amwaj Scooter Rental and Al Marjan Marine Amusement companies, departed their berths in Khorfakkan, Sharjah, to commence towing canopies for commercial public parasailing flights. After about one minute of flying, a strong onshore wind arose which exceeded the operational limitations of the two canopies and their towlines. The towlines of both canopies snapped. One towline snapped when its towboat capsized. The canopies were blown by the wind to landing at a nearby farm. Each canopy had three occupants, one of whom sustained a minor injury because of the Incident.

The Incident led the Air Accident Investigation Sector (AAIS) to initiate a Safety Study of parasailing activities in the United Arab Emirates.

The objective of this Safety Study is to identify a governing aviation system for parasailing in the elements of regulation; technical, operational, and safety standards; certification and licensing; oversight; and enforcement. The scope of the Study is focused on the aviation model of parasailing activities with limited discussion of recreational flying activities in general. The Study methods were based on data collection from records, manuals, interviews, and website reviews.

The conclusion of this Safety Study is that although parasailing operations contain multiple risks, parasailing is insufficiently regulated within the national aviation system.

Safety recommendations are addressed to the General Civil Aviation Authority (GCAA), the local Emirates departments of civil aviation, and to the parasailing operators.

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CHAPTER 1. INTRODUCTION

1.1 What is Aviation Safety Study?

Aviation Safety Studies conducted by the Air Accident Investigation Sector of the United Arab Emirates (AAIS) are initiated when an adverse safety trend, indicating a specific risk factor, is identified and an assessment of the existing situation is considered beneficial to the improvement of safety.

Safety Studies are sometimes carried out by the AAIS because of investigations conducted into similar occurrences, or into occurrences where the same operation or organization is involved.

Safety Studies cover a wide spectrum and are effective tool for—

- analysis of an adverse safety occurrence trend
- analysis of identified recurring factors in recent events
- analysis of specific risk factors
- reporting on a specific aspect of safety interest.

The AAIS is responsible for the research, analysis, and conclusions contained in Safety Studies. The outcomes of Safety Studies can lead to the AAIS issuing safety recommendations addressed to bodies of operations, or bodies responsible for promulgating regulatory requirements, issuing approvals, or conducting oversight functions

1.2 Objectives of this Safety Study

The objectives of this Safety Study are to—

(a) identify the hazards and risks associated specifically with parasailing activities

(b) identify the role of establishing a State-level regulatory model for parasailing

(c) recommend State bodies to be responsible for the maintenance of technical, operational, and safety standards; issuing of approvals, certificates and licenses; conducting oversight; and assuming enforcement functions for such activities

(d) identify a possible role for the General Civil Aviation Authority of the United Arab Emirates (GCAA) in such operations and how can this be implemented.

1.3 Study Methods

Data for this Safety Study was collected through interviews with the owners Kasir Al Amwaj Scooter Rental and Al Marjan Marine Amusement companies, which were engaged in two parasailing incidents, occurred on 9 November 2019.

A boat, which was involved in one of the two incidents that initiated this Safety Study, was examined. The boat, towline, and various other pieces of equipment involved in the incident were examined and photographed. The driver of the boat and his assistant (who was flying the canopy on the day of the incident with two passengers) were interviewed.

A questionnaire related to parasailing operations was developed and was used to collect information from companies in Khorfakkan. The questionnaire also contained questions on recreational flying in general and was distributed to the Department of Transport in Abu Dhabi (DoT), Dubai Civil Aviation Authority (DCAA), and Departments of Civil Aviation (DCA) in Fujairah

and Ras Al Khaimah (RAK). Responses to the questionnaire were received from the DoT, the DCAA and RAK DCA.

1.4 Scope of the Safety Study

The scope of the Safety Study is focused on parasailing activities in the United Arab Emirates. The Study also contains limited discussion of other recreational flying activities in general.

It is recognized that the GCAA does not have either the maritime background or personnel, nor the waterborne assets, necessary to monitor parasailing. Similarly, the maritime authorities do not have the necessary aviation background. Therefore, the scope of this Study encompasses both the aviation and maritime aspects.

Note. — For the purpose of this Study, the word 'Incident' with first letter capitalized, will indicate the two parasailing incident flights that occurred on 9 November 2019.

CHAPTER 2. KHORFAKKAN INCIDENT

2.1 History of the Incident

On 9 November 2019, two boats in Khorfakkan, Sharjah, the United Arab Emirates, departed their berths for towing two parasail flights organized by Kasir Al Amwaj Scooter Rental and Al Marjan Marine Amusement companies. Each parasail was carrying three people: two passengers and one controller from the company.

The two boats departed from their berths at about 1400 LT of the United Arab Emirates after receiving an order from the companies' operation control centers. The operation control centers were located on the beach next to the activities location.

The boats sailed to the beach to commence parasailing operations. They obtained access permits from the Coast Guard checkpoint. The boats had carried out uneventful parasailing activities during the morning.

The companies received intending parasailing passengers at the beach. In the Incident flights, the canopy was waiting for two passengers and the assistant (canopy controller) and the ground staff helped the passengers to fasten their harnesses.

The boats left the beach and commenced sailing against a low-speed onshore wind. The passengers commenced their flights using a 'beach parasailing' launch method where a towline attaches the canopy to the boat and as the boat accelerates the canopy and passengers, after they take several steps, become airborne.

In the Incident flights, after launch, the canopies were under control and gained height. Eventually they reached their maximum height, which was determined by the length of the towline. The boats continued to tow the canopies for about one minute when the wind strengthened considerably. The towline of one of the canopies snapped under tension overstress. The other boat later capsized due to the high sea state, and the towline to the canopy snapped.

According to the statement of one of the canopies controllers, that canopy was under partial control after it broke. The controller landed the canopy at a nearby farm resulting in a minor injury to one of the two passengers. A passenger from the other engaged parasail was transported to the hospital for observation having suffered a minor injury. This passenger was discharged on the following day.

2.3 Incident Investigation

Investigators from the AAIS visited the site and documented the site topography, equipment, and carried out interviews with the persons involved in the Incident. The owner of a parasailing company engaged in the Incident was personally interviewed. A telephone interview was carried out with the owner of the other company.

2.3.1 Weather conditions

According to the weather forecast (Weather Bulletin), issued by the National Center of Meteorology (NCM) for Khorfakkan beach for the period from 0900 of 9 November 2019 to 0900 LT next morning, the wind speed at the coast and islands would be southeasterly-northeasterly, with a speed range of 20 to 35 kilometers per hour "(kph)" (10.8 to 18.9 knots) which may reach up to 45 kph (24.3 knots). The Bulletin also added that the unstable weather would last from Saturday (9 November 2019) to Monday (11 November 2019).

It was also forecast that: “Clouds will appear over scattered areas of the country, becoming convective & rainy at times, especially over the coast, islands, northern and eastern areas. Moderate to fresh winds, especially connected to the cloud activity would cause blowing sand. Sea would be moderate, becoming rough with cloud activity in the Arabian Gulf and in the Oman Sea.”

A weather warning was issued at 1000 for the period from 1100 to 1500 LT. The warning stated that there was a possibility of strong winds and rain. The sea state was forecast to range between moderate to rough seas.

The weather aftercast provided by the NCM indicated that on the day of the Incident, during the period 1400 to 1430 LT, the wind speed was measured three times at 15 minutes intervals, and the information recorded was: 28 knots coming from 249 degrees at 1400, 26 knots from 24 degrees at 1415, and 26 knots from 29 degrees at 1430.

Neither parasailing operator involved in the Incident was aware of the weather forecast since there was no provision in their daily business checklist to check the forecast before commencing parasailing operations. The operators did not subscribe to any official weather data source.

2.3.2 Examination of the equipment

The canopies that were flown for the Incident flights were Waterbird Super Chinook 36 and 38.

According to the specifications and operational limitations published in the canopy manufacturer (Waterbird) catalogue, the 36 model can carry two to three passengers, up to a maximum weight of 245 kilograms (kg). The 38 model can carry three to four passengers, up to a maximum weight of 270 kg. The maximum wind speed for the 36 model is 17 kph (9.2 knots), whereas it is 15 kph (8.1 knots) for the 38 model.

Figure 1. Towline of one of the canopies

The canopies were preserved in the stores in their bags and were not inspected by the AAIS.

One of the inspected towlines was found to have snapped approximately half way along its length (figure 1), at a place away from the expected weakest point which is the knot connected to the canopy at the yoke side or to the boat connection at the towing stanchion. There was no log record as to the towline manufacturer, specifications, time in service, preservation, or acceptable damage. The actual towline strength was not measured by the AAIS Investigation.

Figure 2. Harness of one of the canopies

No information was available for the occupant harnesses. However, no damage, that could have lessened their strength, was observed (figure 2).

One of the boats involved in the Incident was available for examination, which revealed that the boat was not maintained in accordance with a documented procedure. There was no record available to verify serviceability. The boat appeared to be in poor condition. The stanchion, where the towline is attached to the boat, was worn and heavily corroded (figure 3).

2.3.3 Working personnel

The personnel who participated in the parasailing operations during the Incident were the boat driver, an controller (commonly known as *assistant* within the operators staff), who usually flies with the passengers to control the canopy, and an employee from the company (parasailing operator) who was organizing the payments and the passenger queuing order on the beach.

Figure 3. The stanchion used to attach the towline to the boat

Other than the boat driver, who held a license from the Federal Transport Authority – Land and Maritime, no other person involved in the preparation of the operation, or control of the canopy, held any license or had any evidence of training.

2.3.4 Operations management

The parasailing operators, who were engaged in the Incident, were both in possession of a trade license issued by Sharjah Economic Development Department (SEDD). The trade license granted the privilege of practicing aqua sport activities, parasailing, and renting water scooters. According to Sharjah Department of Civil Aviation, they provide a no-objection certificate (NoC), issued by the licensing unit, for these companies, valid for one year.

The Incident flights launched from the beach. In this method, the controller is secured in the canopy harness, and the passengers are secured on either side of the controller. The three harnesses are attached to a passenger bar that is attached to the canopy (see section 3.2).

The operators had no manuals, records, documented procedures, safety procedures, equipment serviceability, weather information, sea condition identification, or procedures for dealing with emergencies.

CHAPTER 3. PARASAILING EQUIPMENT AND FLYING METHODS – GENERAL

3.1 Parasailing

Parasailing is a watersport adventure that allows individuals to fly suspended from a canopy secured to a boat by a harness-to-towline connection.

Parasailing involves passengers who are attached to a specially designed canopy (parasail), being towed behind a vehicle (such as a boat or a car). When the vehicle starts to move and the towline pulls on the parasail, the parasail should already be open. The wind speed together with the speed of the vehicle cause the parasail to produce lift and rise into the air. Passengers are fastened into the canopy by a series of buckles, straps, and other secure locking mechanisms. As the speed of the vehicle increases, the canopy raises higher into the air.

There are two types of parasailing: parasailing that is performed over water where a towboat is used, called aquatic parasailing; and parasailing that is performed over land where the parasail is towed by a car, called terrestrial parasailing.

3.2 Aquatic Parasailing

There are three launch methods for aquatic parasailing: the beach method; platform method; and the winchboat method.

3.2.1 Beach parasailing method

For the beach method, the execution of the launch has two elements: first, the passenger(s) run down the beach behind the boat; second, the boat accelerates as the passenger(s) continue running until lift is created and the parasail ascends.

A two-member crew is required for the launch and recovery operation. One of the crew, whose function is to control the canopy, normally flies with the passenger(s). The other crewmember checks the passengers' are secured in their harnesses.

To cause the parasail to descend at the end of the flight, the controller, or the passenger (if there is no controller from the operator), pulls the appropriate lines on the parasail and it descends to land.

Figure 4 illustrates the beach parasailing flying sequence.

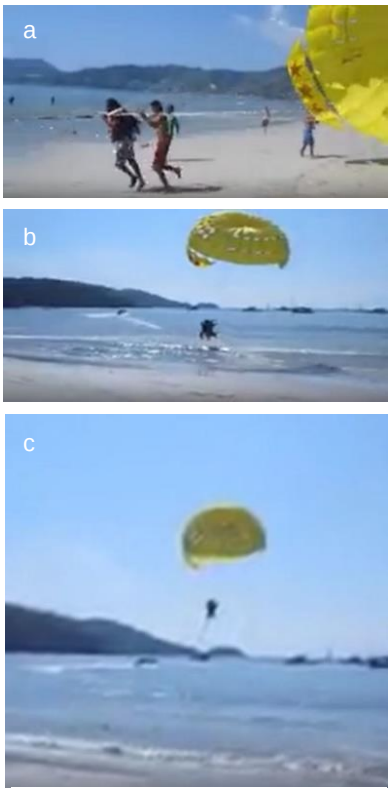

Figure 4. Beach parasailing flying sequence

3.2.2 Platform parasailing method

For the platform method, a platform is positioned in a body of water to allow for the parasail launch and recovery operation. This method is not practiced in the United Arab Emirates.

Figure 5 illustrates the platform parasailing flying sequence.

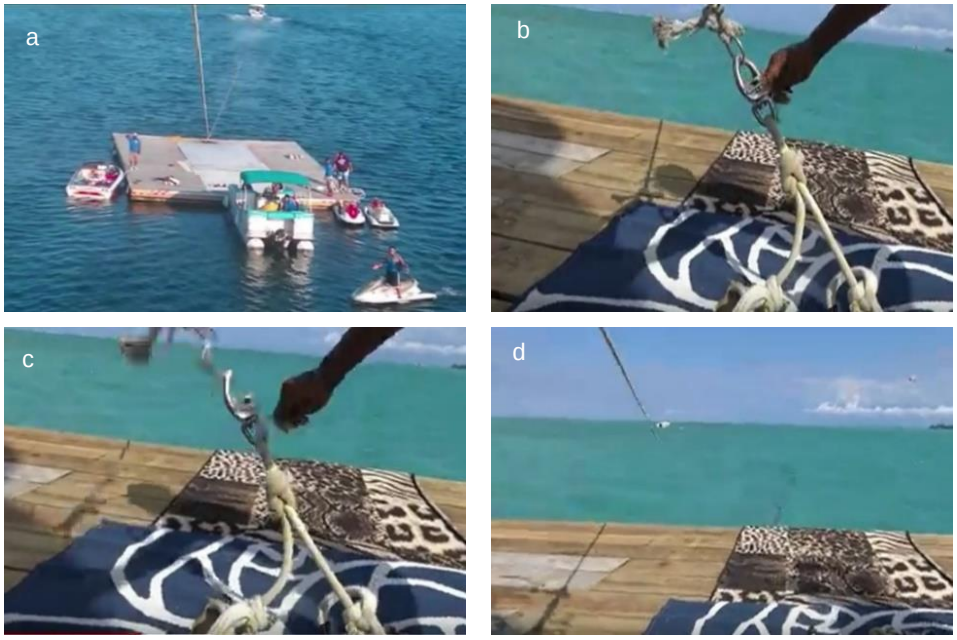

Figure 5. Platform parasailing flying sequence

3.2.3 Winchboat parasailing method

The winchboat method evolved from the parasailing platform method. This method allows the parasailing operator to have fewer crewmembers to operate. For this method, no crewmember is required to control the canopy during the flight.

Figure 6 illustrates the winchboat parasailing flying sequence.

Figure 6. Winchboat parasailing flying sequence

3.3 Parasailing Procedures and Equipment[1]

The parasail is an ascending or lifting parachute that may be towed aloft in the same manner as a kite. As speed increases, the parasail ascends. When towing slows or stops, the parasail descends, similar to a conventional parachute. By controlling the speed of the tow vehicle, it is possible to fly the parasail at any height permitted by the length of the towline.

[1] Reference: Special Investigation Report issued by the National Transportation safety Board (NTSB) of the United States, number NTSB/SIR-14/02, PB2014-106341, issue date: 18 June 2014

Generally, a parasail canopy has a total of 72 panels—16 main panels or “gores” shaped similarly to pie slices, and two stabilizer panels, one on each side of the canopy, as shown in figure 7. Each gore and stabilizer panel comprises four individual panels sewn together.

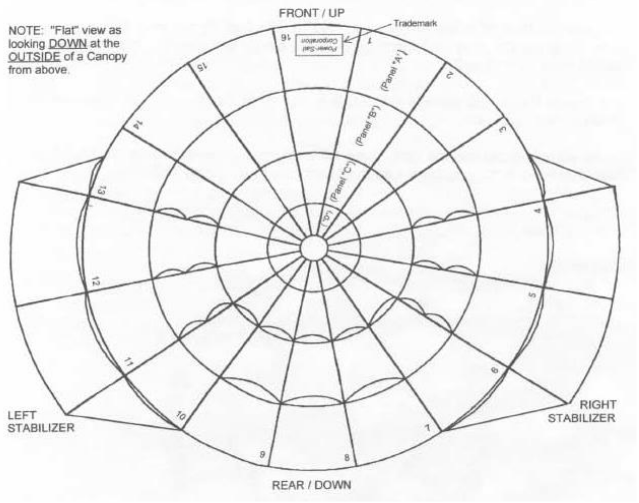

Figure 7. Canopy diagram

Suspension lines are located between each gore. Two lines, called centerlines, are attached to the inside top of the canopy. Openings between gores in the rear of the canopy, called lifting slots, direct the incoming air downward to provide lift, as shown in figure 8. Similar openings on the sides of the canopy, called turn slots or air management systems, provide stability and trim during flight. However, they are zippered slots and must be set by the operator before flight.

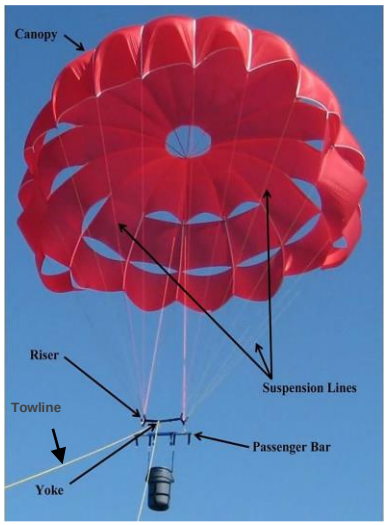

Figure 8. Parasail in operation

The canopy lines are attached to the riser, which also has a built-in yoke for attaching the towline. Below the riser is the passenger/flight bar, which can be configured to carry one to three people, depending on canopy and flight bar weight limits. Each passenger’s harness is attached by two straps to the bar, and the passengers hang below the bar during flight. In some cases, the harnesses of up to two passengers can be attached directly to a different riser when a flight bar is not used (figure 9).

In the winchboat method, the towline is attached to the yoke on the parasail riser, and at the other end to a hydraulic winch located in the aft on the vessel, usually below deck. The winch controls the length of the deployed towline, which, combined with the wind and vessel speeds, controls the height of the canopy.

Air vents in the rear of the canopy create aerodynamic lift. The left and right stabilizer panels provide directional stability under tow. The front of the canopy is generally identified by the parasail manufacturer’s trademark (facing outwards). At this point, panels and/or lines #1 and #16 are attached to left and right front (upper) risers. Likewise, the rear of the canopy is attached to the rear (lower) risers.

Figure 9. Operational parasail without flight bar

For the winchboat method, the winch also provides a controllable takeoff and recovery of the passengers from and onto the “flight deck” at the stern of the vessel. To inflate the canopy, the parasailing operator stages it on the vessel’s flight deck, turns the vessel into the wind, and pays out enough towline to set the parasail bar overhead of the flight deck. The personal flight harnesses of the passengers are secured as required to the

particular system that is being used. The towline is then paid out in various lengths to achieve the desired height.

Passengers are launched and recovered in either a standing or seated position from the flight deck. While aloft, the passengers have no control mechanisms by which to steer, deflate, or otherwise control the direction or lift of the canopy. The passengers are entirely dependent on the towing vessel's crew for all aspects of the flight, including height and speed.

Normally, the passengers maintain hand signal communication with the vessel's crew for any changes that may arise.

CHAPTER 4. PARASAILING ACTIVITIES IN THE UNITED ARAB EMIRATES

4.1 Parasailing Activities – Current Situation

Parasailing is one of many recreational flying activities practiced in the United Arab Emirates (see appendix A for other types of popular recreational flying activities). Currently, the beach and winchboat parasailing methods are the most common practices.

Unlike light sport aviation activities (LSA) that are organized by clubs or organizations approved by the GCAA, parasailing and some other recreational flying activities are practiced individually with no specific regulatory requirements or technical, operational, or safety standards. Parasailing is left completely for the control of parasailing operators.

Parasailing operators are issued with a generic trade license by non-aviation authorities. For instance, Sharjah Economic Development Department (SEDD) is a local Emirate authority that issues a trade license to companies practicing aqua sport activities and parasailing. The trade license is associated with a no-objection certificate (NoC) issued by the licensing unit in Sharjah Department of Civil Aviation.

There are no specific provisions in any of the federal or local regulations requiring parasailing operators or personnel to obtain a special license, certificate, or any kind of approval to establish and carry out operations. The only person who is required to be licensed is the towboat driver who is usually issued a license by the Federal Transport Authority – Land and Maritime. The license does not require specific training for controlling a parasailing towing vessel. In addition, none of the personnel who are engaged in the parasailing operation, inflight control, or ground support, is required to be trained or licensed for flight safety or lifesaving.

The towboat is issued a vessel *certificate of registry* under the 'commercial tourism' category, and the safety equipment required to be onboard is the normal fit such as a fire extinguisher, float, and emergency tracking system connected to the coast guard emergency operations center.

The parasailing operators do not maintain procedure manuals or checklists for inspection of equipment, including the boat, the canopy, the towline, the harness, and all the other accessories. The operators do not possess documented procedures for the inspections, and they randomly carry out visual inspections of the equipment and accessories without sufficient knowledge of the inspection items and without referring to manufacturer's technical references and manuals.

At least one of the parasailing operators involved in the Incident was using towlines with no clear technical material specification denoting composition, preservation, life limitations, and inspection techniques. Both parasailing operators involved in the Incident stated that they usually rinse the towline and the canopy at the end of operations, and preserve the equipment in bags in a controlled environment store. They also stated that they normally dispose of the towlines and canopies after two years for the canopy and two to four months for the towline. However, no evidence was provided to support their statements.

The parasail passenger safety procedure was not documented. There was no specific safety brief given to the passengers before commencing a flight. One of the parasailing operators involved in the Incident used to issue invoices to the passengers that contained a disclaimer that stated: "The company is not responsible for the people who suffer from heart diseases, blood pressure, brightness from high places and any other diseases." According to the operator, the disclaimer would relieve him from liabilities for injuries to the passengers or bruises caused by exposure to water or beach in a "Hard way".

The parasailing operators involved in the Incident did not subscribe to any official national meteorology center to obtain weather forecast reports prior to commencing operations for the day. Both operators stated that the sailing permission provided by the Coast Guard checkpoint would mean that the weather condition is within operational limitations, and they assumed that the Coast Guard would have already checked the weather and sea conditions before providing permission. None of the parasailing operators' personnel could interpret weather reports and compare the forecast conditions against the parasail operational limitations as published by the canopy manufacturer.

The crew of one of the boats involved in the Incident were interviewed and they did exhibit sufficient knowledge and understanding of the parasail operational limitations in terms of wind speed and sea state. When the owners of both parasailing operators involved in the Incident were asked about the manuals they follow in their operations, they did not show any evidence of using any recognized operational or technical reference for flying and maintaining the beach parasail Super Chinook 36 and 38 models.

The means of communication between the canopy controller and the towboat driver was by physical signaling. The various signals used, and their meanings, were not documented. The boat driver was expected to maintain visual contact with the canopy controller to monitor the maneuvering of the canopy and to watch for any emergency that might arise.

Both of the parasailing operators involved in the Incident also operated boats that were equipped for winchboat parasailing. In their interviews, they stated that winchboat parasailing is safer, and lasts longer (8 to 15 minutes) than the beach parasailing (two to four minutes). They also stated that winchboat parasailing is more costly because the operations require bigger boats that can facilitate 15 to 20 passengers, and the parasailing operations require more preparation crew and time. In this parasailing method, all passengers are carried together on the boat and the onboard crew manage the flying order for each sortie. This method does not require a canopy controller because the winch operator onboard the boat has full control. However, both owners stated that this parasailing method is not attractive to passengers because it is more expensive and less adventurous.

In general, the parasailing operations in Khorfakkan are limited to the weekend according to an agreement between the municipality and Khorfakkan Fishermen Association. Based on the agreement, the parasailing activities commence at 1400 LT on Thursday and end at sunset on Sunday.

4.2 Regulatory Framework

The GCAA requires organizations engaged in light sport aviation activities to obtain an *approved flying club certificate.* The certificate confirms that the organization complies with Civil Aviation Regulation (CAR) Part II, Chapter 10 – *Light Sports Aviation Activities (LSA)*. The *LSA certificate* requires that NoC be issued by the local Emirate department of civil aviation as a pre-requisite. An *operations specifications* document is issued to associate the privileges of the certificate with the type of aircraft and the nature of the operation. The *operations specifications* document also contains the designated areas of operations, operations manual, and aircraft maintenance requirements.

In the LSA regulation, *light sport aircraft* is defined as "A power or non-power driven light aircraft that has several shapes, sizes and types.", and *light sports aviation activities* is described as "Recreational aerial activities practiced using light sport aircraft or remote control aircraft." This regulation is not applicable to parasails since parasail is not listed in the applicability table that

includes classes of LSA aeroplane, sailplanes, weight-shift vehicles, gyrocopters, parachutes, paramotors, and light than air.

The requirements of the *LSA certificate* are enforced on the organizations by the GCAA through the use of a systemized oversight program.

The GCAA has limited control over LSA, or other recreational flying activities, undertaken by non-LSA certificate holders. This led the GCAA to enter into an agreement with the Ministry of Interior (MoI) to strengthen enforcement functions. The agreement facilitates training of MoI officers by GCAA personnel to enable them to identify light sport aircraft from its appearance features and then take the necessary enforcement action when needed.

According to CAR Part III, Chapter 8, CAR-AARA – *Aviation Activities Requiring Approval*, flying activities requiring approval include the use of manned and unmanned aircraft and balloons engaged in recreational activities. The provision states that—

> "8.1 Requirement
>
> No institute, club or other organisation shall engage in flying, flying instruction or training, or perform any other aviation activity without approval from the Authority, and in accordance with the terms thereof.
>
> 8.2 Flying Activities
>
> 8.2.1 Flying activities requiring approval include the use of manned and unmanned aircraft and balloons in:
>
> (a) commercial and aerial work operations
>
> (b) private operations
>
> (c) flying training
>
> (d) flying club activities
>
> (e) recreational activities
>
> 8.2.2 Application. Any organisation involved in the above aviation activities should apply to the Authority [GCAA] for approval in accordance with the application provisions of CAR or CAAP as appropriate."

Civil Aviation Advisory Publication (CAAP) 15 – *Flying Displays*, issued by the GCAA, considers the parasail under the classification of "objects and activities affecting airspace" in line with CAR Part VIII, subpart 3, section 3.1, and its associated Guidance Material (GM) 1. This classification requires a person to "Notify the GCAA of the SUA [special use airspace activities] and complete the e-application available on the GCAA website, and submit it at least five working days before the proposed date of use of the SUA."

The GCAA has not defined recreational flying, but the regulator stated "Notwithstanding the definition of light sport aviation activities, recreational flights are flights intended for leisure and hobby activities. They are not intended for remuneration and hire. (If parasailing is for remuneration, it does not fall under this definition as it is being commercialized)."

A question forwarded to the GCAA regarding the categorization of "parasailing", elicited an answer that parasailing is "A commercial recreational activity that affects airspace and requires approval as per CAR Part III in conjunction with CAAP 15, at least."

4.3 Local Emirates Departments of Civil Aviation

After the Incident, the Sharjah Department of Civil Aviation suspended all parasailing operations in Khorfakkan. The Department listed, in its investigation report into the Incident, some guidelines to ensure safe parasailing operations.

The Abu Dhabi Department of Transport (DoT) responded to the questionnaire by stating that recreational flying activities "Fall under the CAR II, Chapter 10, and these activities can only be operated under a certified club." The DoT added that "Certification of the club is done through GCAA where one of the requirements is to obtain an NoC [no-objection certificate] from the local concerned authority (DoT in the case of Abu Dhabi)." Enforcement is the responsibility of the MoI.

Abu Dhabi Sports Aviation Club is issued an *approved flying club certificate* following receipt of NoC from the DoT. The Club advertises that it is "Licensed for fixed-wing light sports aircraft, advanced certified microlights, and also gyrocopters, skydive, paramotors, and parasailing."

The Dubai Civil Aviation Authority (DCAA) responded by stating that their role does not have a framework for para-operators in terms of certification. The DCAA only approve requests for special use airspace (SUA) activities by way of NoC for specific events, in coordination with Dubai Air Navigation Services (dans). This type of approval mainly relates to wingsuits and paramotors.

The main operator in Dubai facilitating recreational flying activities is Sky Dive Dubai. Their activities are practiced within designated areas. Other areas may be approved on an ad-hoc basis for demonstrations and special events. The DCAA stated that "There are no companies or clubs licensed by any official Dubai body to practice such activities."

According to the response received from Ras Al Khaimah Department of Civil Aviation (RAK DCA), they apply a system similar to that of the Abu Dhabi DoT. Jazirah Aviation Club in RAK has been issued with an *approved flying club certificate* by the GCAA after NoC was issued by RAK DCA.

4.4 National Organizations for Organizing Parasailing and Other Recreational Flying Activities

The Emirates Aerosports Federation (EAF) was established in 2012 as a "Nonprofit organization to coordinate and give direction to the rapidly growing aero sport in the United Arab Emirates."[2] The structure of this organization is identical to the structure of the The Fédération Aéronautique Internationale (FAI)[3] and its functions are similar.

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[2] www.eaf.ae

[3] www.fai.org

The FAI was founded in 1905 as a non-governmental and non-profit making international organization with the basic aim of furthering aeronautical and astronautical activities worldwide, ratifying world and continental records and coordinating the organization of international competitions, with more than 100 member countries.

The FAI activities include the establishment of rules for the control and certification of world aeronautical and astronautical records. FAI establishes regulations for air sporting events which are organized by member countries throughout the world. FAI also promotes skill, proficiency and safety in aeronautics.

Within the framework of FAI, each air sport has an International Commission, which is responsible for making the rules for competitions and which generally oversees the activities of their particular air sport.

Regulations, rules or recommendations that have been accepted by the Commissions during their annual meetings are followed up by the delegates themselves at the national level and with member countries, which need help developing their air sports.

The FAI mission is "The global organization for the promotion of air sports and recreational flying". The vision is stated as "A world where safe participation in air sports and recreational flying is available to everyone at reasonable cost".

The EAF activities “Include the establishment of rules for the control and certification, establishes regulations for the air sporting events which are organized by members within the Emirates. EAF also promotes skill, and safety in the sport. Within the framework of EAF, each sport has a commission which is responsible for making the rules for the certifications, and generally oversees the activities of their particular sport.”

The EAF website had advertised the Sharjah International Paragliding Championship which took place in February 2020. This event was open to all national and international pilots. The only condition mentioned in the advertisement was that the flying of paragliders is to be supported by an authorized license or documents issued by an aviation club.

No information or references were found regarding which clubs based in the United Arab Emirates are recognized by the EAF, nor was there any reference to regulation and certification of aerosports and individuals involved in aerosports.

According to the website, the EAF directs championships in the United Arab Emirates for parachuting, ballooning, aerobatics, gliding, hang gliding and paragliding, microlight and paramotor flying, and “remotely controlled” aircraft. The EAF states in the website that it establishes and maintains rules and criteria for the EAF members through commissions.

The lack of parasailing categorization prevented anybody in the United Arab Emirates from initiating regulatory requirements or technical, operational, or safety standards.

CHAPTER 5. PARASAILING ACTIVITIES IN OTHER STATES

5.1 International Parasailing Safety[4]

In many States, parasailing is a recreational flying activity that takes place near beaches and lakes. However, this activity is largely unregulated (with the exception of Queensland, Australia). In 2000, the State of Queensland imposed mandatory standards to address the risks associated with parasailing. The standards, revised in 2007, are comprehensive and address equipment, personnel, weather, operations, passengers, and risk management.

During the course of the NTSB Special Investigation into parasailing accidents that occurred between 2009 and 2013, the investigators queried the United Kingdom's Maritime and Coast Guard Agency and found that although requirements such as basic lifesaving, firefighting, and safe operations were in place for small craft, no codes, regulations, or other requirements specifically addressed parasailing.

In Canada, some minimal requirements have been instituted for all towable water activities, but not specifically for parasailing. The requirements mandate that an observer must be present, that the person being towed must wear a lifejacket or other personal flotation device, and that the activity must be performed during daylight hours. There is also a communication requirement; however, hand signals will suffice.

In the United States, Federal Aviation Administration (FAA) regulation 14 CFR Part 101 is the only existing regulation affecting parasailing. The regulation is limited in scope and includes parasails as a type of "Kite that weighs more than 5 pounds and is intended to be flown at the end of a rope or cable. However, according to the NTSB Special Investigation Report, the United States Coast Guard (USCG), if given enforcement authority, has the capability and local resources to enforce FAA regulations with regard to parasailing operations, and can also take enforcement actions including terminating the vessel's voyage for unsafe or especially hazardous conditions. The USCG may take suspension or revocation action against the operator's license. Accordingly, the NTSB recommended that the FAA should request assistance from the USCG to enforce existing FAA regulations according to the USCG's parasailing guidance.

In its brochure for parasail operators, the USCG recommended that the equipment be maintained according to the manufacture's maintenance instructions. Operators should be aware of weather and other condition and limitations and train their crewmembers for emergencies. Parasailing should only take place in company-designated locations. There should be communication among operators and with local officials to ensure that the area selected for operations is clear and a safe operating distance must be maintained from any surf zone, shoreline or object. All passengers must be briefed on the use of all safety equipment (including harness quick release) and emergency procedures.[5]

There is no specific role assigned in any State for the national civil aviation authority to oversee parasailing activities. Regulations affecting parasailing are distributed within the structure of the States' rules and regulations. The general flight rules contain provisions for airspace boundaries, and restrictions regarding flying over crowds and urban or security sensitive places. Maximum flying heights are specified in order to avoid risk to other low flying aircraft.

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4 Reference: NTSB Special Investigation Report, issue date 18 June 2014

5 https://homeport.uscg.mil/Lists/Content/Attachments/931/Parasail%20Brochure.pdf

Regulatory attention is now on the winchboat parasailing methods since beach parasailing is forbidden in many States. In addition, some leading trade associations for parasailing have published rules for parasailing. However, there is no specific role for such agencies in developing technical, operational, and safety standards[6].

[6] There are some leading trade associations for parasailing:

- Parasail Safety Council. In the website, they advertise hat this Council is "The world's premiere source for parasail information." The website contains definitions for terms used in the parasailing operations, and canopy construction, it also contains "Consumer Parasail Safety Tips" that are directed to winchboat passengers to:
  - carry out visual Inspection of the boat and tow rope and avoid parasailing with an operator whose equipment looks old and weathered
  - choose a parasail business that operates from an established location and not a beach front.
  - make sure that the operator explains all of the risks before signing the release form
  - be provided with pre-flight safety briefing about the basic description of the parasail activity, equipment and inherent risks, safety precautions during your excursion while onboard the vessel, the proper use of hand signals in the event to be retrieved before the flight ends, the correct position for landings, and detailed rescue instructions and survival techniques in the event of equipment failure, emergency water landings especially in high winds and/or rough seas.
  - check the local weather before parasailing. Never fly in rain, fog or an approaching storm fronts in the area. Avoid parasailing in winds over 15 mph which can increase risk in the event during an emergency water landing.
  - check the age limits
  - avoid parasail if a possibility exists for getting panic or feel uncomfortable or hesitant to parasail
  - consider limitation of communication and rescue for long distances (beyond 600 feet) from the parasail towboat that will reduce your ability to communicate with the boat driver and onboard crew
  - determine flying altitude by knowing the towline length
  - consider parasailing distance from the shoreline which is about three times of the towline length
- Professional Association of Parasail Operators Europe (PAPO). According to some parasailing operators' advertisements in the internet, they claim that they are certificated by PAPO and their crew endorsed. However, this information and the extent of this organization could not be concluded

CHAPTER 6. DISCUSSION AND ANALYSIS

6.1 Parasailing Risks

The parasailing Incident described in this Safety Study resulted from failure of both parasailing operators to monitor developing weather conditions, and using an ordinary commercially available towline. The recorded wind speed at the time of the Incident was about 28 knots, which exceeded the 8 to 9 knot limitation of the Waterbird Super Chinook 36 and 38 canopies. The operators lacked access to weather forecasting sources and lacked experience in preparation for operations during abnormal weather conditions. The operators' actions were not prudent and they did not exercise reasonable care due to poor judgment, lack of sufficient experience, improper training, or a combination of these and other factors. In addition, the lack of weather reports prevented them from being aware of the expected high wind and sea state.

Parasailing passengers are exposed to hazards that are not commonly known to the parasailing operators, to the GCAA, or to any other authority or organization that may have an involvement in the operation. However, the risks that the winchboat or beach parasailing passengers are exposed to is high in some aspects of the operation. A passenger is attached to a towboat by a towline which may easily be obtained from an unknown source, and the passengers are attached to the canopy by harnesses that have no documented history of purchase, specification, preservation requirements, or damage logs.

The towboats involved in the Incident noted in this Safety Study were not maintained in accordance with documented operational or maintenance procedures, and there was no log available to support the technical and safety status of the vessels. The personnel who were engaged in the Incident flights were not sufficiently competent to exercise valid judgment, skill, and control. The other portable safety tools and equipment, not permanently attached to the boat, such as the fire extinguisher, personnel floatation device, etc., were provided without any overall serviceability assurance.

Both beach and winchboat parasailing methods are practiced in different places in the United Arab Emirates. The risks attached to such operations have not been assessed by any authority or by any aviation aerosport association, club, or organization. Although establishing a specific approval method for parasailing operators and their working personnel would not eliminate all of the shortcomings attributed to organizational and human factors, it would establish a minimum standard of safety requirements and professional competence.

Although the beach parasailing launching methods was practiced in the two Incident flights, the potential hazards and latent risks of winchboat parasailing are greater. In this method of parasailing, winchboat serviceability must be included as a hazard and consideration must be given to multiple scenarios and possibilities of technical failure.

The risk of winchboat parasailing was underlined by several fatal accidents that occurred in the United States. Because of these occurrences, the National Transportation safety Board (NTSB) carried out a Special Investigation and issued a comprehensive Special Investigation Report on 18 January 2014. The United States Coast Guard (USCG) issues brochures that contain safety guidance and recommended safety actions. The USCG is also authorized by law to take actions up to and including suspension or revocation action against the operator's approval.

6.2 Parasailing Operations System

The affordable cost and lack of State-level pilot requirements, combined with a demographic shift regarding increased disposable income and leisure time, have contributed to open this form of recreational activity to a diverse group of participants. In addition, the geographic location of the United Arab Emirates, combined with a favourable climate for most of the year, and open beaches, provide good opportunities for many people to engage in recreational flying activities, including parasailing.

An argument may arise in interpreting the current GCAA regulatory requirements as mentioned in the *Light Sport Activities* (Civil Aviation Regulation (CAR) Part II, Chapter 10) and *Aviation Activities Requiring Approval* (CAR Part III, Chapter 8, CAR-AARA). The LSA regulations do not include parasails in the applicability list, and the AARA do not clearly categorize parasailing as a recreational flying activity which requires approval.

The Civil Aviation Advisory Publication (CAAP) 15 – *Flying Displays*, issued by the GCAA, limits the requirements for approval of parasails as being a type of object or activity that may affect airspace which would require notifying the GCAA before engaging in the activity. The GCAA in this provision does not classify the parasail as an aircraft. As a result of that, governing flight rules are not required for parasailing. However, the Air Accident Investigation Sector (AAIS) believes that the construction of the parasail canopy, and its principles of operation do classify it as an aircraft. This is also the classification adopted by the Federal Aviation administration of the United States, which includes the parasail as a type of kite that weighs more than 5 pounds and is intended to be flown at the end of a rope or cable.

Some of the recreational flying activities are administered and facilitated by clubs through GCAA-approved light sports aviation activities. However, parasailing is not included in any of the clubs listed activities, neither this kind of activities is regulated or taken into adequate consideration. This is essential considering the unique operational and technical standards of the parasailing operations, and the significant risk associated with the activity.

This lack of organisational framework allows the parasailing operators to practice their operations without specific requirements. Their enabling approval solely based on a trade license issued by a local government administrative authority. In the case of Khorfakkan, the trade license issued by the Sharjah Economic Development Department (SEDD) to the two operators engaged in the Incident flights was not supported by any safety requirements or technical standards. The no-objection certificate (NoC) issued by the licensing unit in Sharjah Department of Civil Aviation, was not a foundation of safety framework.

The substantial public interest in parasailing, and categorizing the parasail as an aircraft, should encourage the GCAA to consider parasailing in aviation regulatory framework. That should consider developing high-level regulatory requirements.

The regulatory requirement should consider the development or adoption of technical, operational, and safety standards for parasailing. Oversight and enforcement functions should also be highlighted.

The GCAA is recommended to lead a risk assessment exercise aims at identifying the scope of regulatory requirements, and to what standards are technical, operational, and safety standards to be in conformance with. Determination of the scope of oversight and enforcement functions should be included in the exercise. However, it is logical that these functions be divided among various authorities in the United Arab Emirates, clubs, aerosport associations, and other organisations, under a certain mechanism of coordination with clear identification of responsibilities.

CHAPTER 7. CONCLUSIONS

7.1 Findings Relevant to the Incident Referred to in this Safety Study

(a) The Incident of the two parasailing flights occurred during beach parasailing operations. The Incident involved two canopies, which were each attached to a towboat. Each canopy carried two passengers secured by harnesses, and a canopy controller (assistant).

(b) The Incident occurred due to wind speeds that exceeded the limitation of the parasailing operations and canopy controllability and towline strength. One of the two boats capsized due to high waves and canopy tension.

(c) The lack of an accurate weather forecast, and the assumption that the Coast Guard permission to sailing would indicate that the weather conditions are favorable, led the parasailing operators to undertake the operations in hazardous conditions.

(d) Both parasailing operators possessed a trade license issued by Sharjah Economic Development Department (SEDD) that permitted them to carry out parasailing operations. This license was associated with a no-objection certificate (NoC) issued by the licensing unit in Sharjah Department of Civil Aviation. Neither the trade license nor the NoC were based on documented operational procedures, or technical, operational, or safety standards.

(e) The parasailing operators involved in the Incident did not exercise reasonable care due to lack of experience, training, and procedures.

(f) One of the inspected towlines was found to have been snapped at a point approximately mid-way between the boat and the canopy. The towline did not break at either of the expected weakest point, which would either be the securing knot at canopy end or the securing knot at the boat stanchion. There was no record for the towline supplier, specifications, allowable service life, preservation methods, or allowable damage. In addition, no records were maintained for the canopy harnesses.

(g) The boat, which was examined by the investigators, was in a bad shape. There were no procedures or maintenance log in place to support the serviceability of the boat. The parasailing equipment were also not properly maintained.

(h) The parasailing operational personnel were not sufficiently trained to exercise valid judgment, based on knowledge and skill. They did not operate to any procedures.

(i) Other than the boat driver, who possessed a license issued by the Federal Transport Authority – Land and Maritime, no other personnel involved in the preparation of the parasailing operation and control of the canopy, possessed any type of license, certificate, or evidence of training.

(j) The Coast Guard granted permission to sail based on the forecast weather information available to them at the time.

(k) No cautions or warnings related to the weather were provided to the parasailing operators.

7.2 Findings Relevant to Parasailing System in the United Arab Emirates

(a) Both beach and winchboat parasailing methods are practiced in different places in the United Arab Emirates. However, there is no provisions within the aviation system specific for parasailing, and the risk of such operations had not been assessed by any of the authorities, clubs, aerosport associations, or any other originations in the State.

(b) There is no historical record showing a trend of parasailing safety occurrences.

(c) The General Civil Aviation Authority (GCAA) requires all clubs that practice light sport activities to be granted an *approved flying club certificate* issued in accordance with Civil Aviation Regulation (CAR) Part II, Chapter 10 – *Light Sports Aviation Activities (LSA)*. An *operations specifications* document associates the *LSA certificate* listing the privileges of the *certificate* in terms of type of aircraft, operations, and maintenance control.

(d) Issuing the *LSA certificate* requires that NoC be issued by the local Emirate department of civil aviation. However, parasailing is not listed in the applicability of the LSA regulations.

(e) The GCAA requires parasailing activities to be notified through e-application, five days before the activity. However, the GCAA limits the concept of the parasail as an object or activity that may affect the airspace. This limited scope of requirements prevents the regulatory body from setting sufficient requirements for parasailing.

(f) There is no State-level requirement for issuing certificates or approvals for parasailing operators.

(g) The only provision for recreational flying activities is contained in paragraph 8.2.1(e) of the CAR-AARA – *Aviation Activities Requiring Approval.* The provision requires approval for any organization involved in recreational activities. The term *approved organization* is not defined in this regulation.

(h) There are a number of clubs in the United Arab Emirates that organize recreational flying activities for individuals, but parasailing is not listed in their activities.

(i) Emirates Aerosports Federation (EAF) contains commissions charged with organizing aerosport events. The EAF promotes skill, and safety in aerosport and recreational flying. Within the framework of EAF, each sport has a commission, which is responsible for making rules, certification, technical and operational standards.

(j) The individual Emirate departments of civil aviation have no organized involvement in parasailing activities. However, Sharjah Department of Civil Aviation suspended the parasailing operation in Khorfakkan until certain specified conditions mentioned in their investigation into the Incident were fulfilled. Beach parasailing activities have been prohibited.

7.3 Findings Relevant to Parasailing System in Other States

(a) Parasailing operations are not regulated in the majority of States, and no codes, regulations, or other requirements do specifically address parasailing.

(b) However, the States' systems vary. The enforcement authority in several States is given to the coast guard, or to police.

(c) The role of civil aviation authorities in the parasailing activities is passive.

CHAPTER 8. SAFETY RECOMMENDATIONS

Although establishing an aviation regulatory model for parasailing activities in the United Arab Emirates would not eliminate the risks associated with such operations, such a system can reduce the risks to an acceptable level.

An effective review of the parasailing regulatory model should address high-level requirements; technical, operational, and safety standards; issuing approvals and oversight; and enforcement functions.

Therefore, the Air Accident Investigation Sector (AAIS) recommends that:

(a) The General Civil Aviation Authority (GCAA)

SSR01/2020

Review the aviation regulatory system to ensure that parasailing activities are adequately addressed. Specific attention should be given to the following—

- Direct access to weather information
- Maintaining the parasailing equipment up to the applicable exiting maritime requirements, and sufficiently developed aviation regulatory requirements in addition to recognized technical, operational, and safety standards
- Providing the personnel involved in the parasailing operations with adequate training based on the sufficiently developed aviation regulatory requirements in addition to recognized technical, operational, and safety standards.

(b) Parasailing operators (Kasir Al Amwaj Scooter Rental and Al Marjan Marine Amusement)

SSR02/2020

Develop procedures to ensure continuous compliance with the GCAA regulatory requirements and recognized operational, technical, and safety standards. The parasailing operators should at least have in place procedures for—

- Obtaining credible weather information from reliable sources
- Maintaining the parasailing equipment to the regulatory requirements and technical, operational, and safety standards
- Providing the personnel involved in the parasailing operations with adequate training based on the regulatory requirements and technical standards.

(c) Sharjah Department of Civil Aviation

SSR03/2020

Review the requirements of issuing no-objection certificate (NoC) to assure compliance with the regulatory requirements imposed by the GCAA, and the recognized technical, operational, and safety standards.

LIST OF APPENDICES

Appendix A. Example Recreational Flying Activities in the United Arab Emirates

LIST REFERENCES

- The General Civil Aviation Authority. “E-Publications”. www.gcaa.gov.ae
- The Emirates Aerosports Federation. “Sports”. www.eaf.ae
- Fédération Aéronautique Internationale (World Air Sports Federation). “About FAI”. www.fai.org
- The US Department of Homeland Security. United States Coast Guard. “Homeport”. https://homeport.uscg.mil/
- Parasail Safety Council. http://www.parasail.org/
- Special Investigation Report. “Parasailing safety”. The National Transportation Safety Board, the United States. 18 June 2014

APPENDIX A. EXAMPLE RECREATIONAL FLYING ACTIVITIES IN THE UNITED ARAB EMIRATES

Parachuting and skydiving

[Ref.: CAR Part IV, Special Purpose Operations, Section C- Parachuting Operations

Ballooning

Recreational activity of traveling in a balloon carried along by the wind; flights take place at dawn and dusk, when winds are light and the air is stable.

[UAE Ref.: CAR Part IV, Special Purpose Operations, Section E- Manned Ballooning Operations

UAS

[UAE Ref.: CAR Part IV, Aircraft Operations, CAR-UAS Unmanned Aircraft System (UAS) and Operations

Recreational Unmanned Aircraft (including drones)

[UAE Ref.: CAR Part IV, Aircraft Operations, CAR-RUA Recreational Unmanned Aircraft]

Hang gliding

Sport where a pilot strapped to a hang glider or a paraglider launches from a mountain slope, gains altitude and remains aloft for some distance.

Paragliding

lightweight, free-flying, foot-launched or powered glider aircraft with no rigid primary structure. The pilot sits in a harness suspended below a fabric wing. Wing shape is maintained by the suspension lines, the pressure of air entering vents in the front of the wing, and the aerodynamic forces of the air flowing over the outside.

Glider

Small engineless aircraft that is launched by a tow plane and stays aloft on air currents.

Wingsuit

Sport of flying through the air using a wingsuit which adds surface area to the human body to enable a significant increase in lift

Rotorcraft

That meets defined criteria such as gyrocopters