

RULE 26/44
COMMERCIAL PARASAILING
ACCIDENT ANALYSIS AND DISCUSSION ON PROPOSED
REGULATIONS OF RULE 26/44

BACKGROUND

Commercial parasailing, the carrying of a paying passenger secured to a canopy which is dynamically tethered to a ‘winchboat’, has been in existence since the I begun taking up passengers in and around Miami, Florida in the early 1970’s together along with my numerous inventions and patents (see <http://www.parasail.org/mark-mcculloh.html>)

Today, commercial parasailing has grown in Florida to over one hundred (120+) operations with some offering flights year around and others only during the peak tourist seasons.

Over the years, commercial parasailing has been plagued with persistent serious accidents many of which have resulted in high publicity deaths. These deaths not only pose a risk to the public, but have had a negative impact on the parasail industry’s brand, as well as, that of the global tourism brand the state of Florida. While in the past, the financial risk was limited to the operator, as the deaths continued.

Today, litigation has spread to include property owners and manufacturers. It would not be unrealistic to anticipate that municipalities or other government entities would become parties to the actions if no action is taken. The Department of Justice has also become involved filing criminal cases against Captains and company owners under the

Seaman's Manslaughter Act. Whereas, Florida has never filed criminal charges involving parasail deaths.

JURISDICTION

The Federal Government controls the sport to a limited aspect through the Coast Guard and to a lesser extent the FAA. Florida has traditionally relied upon the Department of Fish and Wildlife along with local policing authorities to control and investigate parasail accidents. Needless to say jurisdiction over a hybrid vessel/air sport is somewhat confusing, which statewide regulations could clarify. Both Houses of the Florida Congress have from time to time proposed regulating the sport following each death with no bills from either body having made it to either floor for a vote. The Senate is now considering introducing regulation of parasailing once again.

QUESTION?

Can commercial parasailing be regulated by the State of Florida in such a manner as to significantly reduce or eliminate serious injuries or deaths?

ANALYSIS

In order to answer this question in a way that is meaningful to reader the dynamics of parasailing, must be briefly explained as the sport is more complex than what most tourists and operators might believe or have been told. Parasailing involves a modified parachute canopy design affecting stability, control, lift and payload theory including but not limited to the characteristics of a dynamically tethered object, the characteristics of an object in rough seas, wind, weather, equipment maintenance and

performance, launch and retrieval systems, vessel operation and people both as crew and passenger. As to people, specifically the reaction of people under highly stressful situations like an emergency waterlanding including drowning. (USCG Search & Rescue Report located at (www.parasail.org/USCG-Search-Rescue.pdf)

For the purposes of this analysis, we have categorized accidents into two types: a) accidents ‘with tow-line separation’ and b) accidents ‘without tow- line separation’. Tow-line separation accidents cause more than 60% of the serious injuries and 98% of all deaths (www.parasail.org/accident-statistics.html)

GENERAL:

Tow-Line Separation:

It is important to note that ‘tow- line separation’ has often been demonized as the ‘cause’ of many fatal accidents when in fact tow-line separation itself, is not dangerous nor is the direct cause of injuries and in some case plays an important role in preventing serious vessel accidents by acting as the ‘ weak link’ thus prevent equipment damage and vessel capsizing injuring both crew and passengers . (See: Lake George, New York accident where cable strength surpassed vessel capability and capsized 2009)

See also Vessel Stability Reports, US Coast Guard Stability Investigations and USCG Commandant Directive on parasail winchboat stability requirements for inspected vessels. Click links below to download reports.

1. [1990-02-28-McCulloh-Evaluation-Stability-Study-to-USCG-Commander](#)
2. [1990-06-USCG-Vessel-Capsizing-Investigation-Recommendations](#)
3. [1991-06-USCG-Commandant-Action-Letter](#)

While a combination of factors may be involved in ‘tow line separation accidents’, there are certain key and reoccurring themes that warrant consideration which can be categorized into two types a) ‘tow- line separation in high winds resulting in non-waterlandings’ and b) ‘tow- line separation in high winds resulting in waterlandings’.

TOW-LINE SEPARATION ACCIDENTS

Tow-Line Separation: (High Wind, Non-Water Landings)

In order to eliminate accidents involving non water landings the parasail flight distance to shore and other fixed objects must be calculated and controlled. By doing this one can conclude by example that flights at 600' feet ASL must remain 1800' from shore to avoid a shore landing. Lower flight parameters would allow for closer to shore distances based on the glide slope ratio of the canopy in use. These calculations and resulting distances are available and easily applied to an operation. . (See: Panama City Accident 2013 involving high altitude flight near shore) **Solution- Regulate distance to shore and other fixed objects**

Tow-Line Separation: (High Wind + Water Landing)

Tow-line separation in high winds resulting in waterlandings has resulted in more than 98% of all of the serious injuries and deaths worldwide. As expressed earlier there is no evidence to suggest that tow-line separation in and of itself is the cause of these injuries. In order to eliminate this type of accident we must analyze the risk factors which follow the separation and attempt to significantly reduce each one of their impact.

Tow-Line Separation Risk Factors: (High Wind + Water Landing)

During a, 'tow- line separation in high winds resulting in a water landings', the crew

and passengers face three risk factors.

1. The first is the characteristic of a parasail canopy to be able to re-inflate itself after its payload (passenger(s) have landed in the water.
2. The second is the parasailor's inability to separate themselves from the canopy thus forcing them to be drug backwards by a re-inflated canopy in whatever path it takes.
3. The third is the glide slope ratio of the canopy as it relates to height and distance to shore or other rigid life threatening objects and the canopy's ability to reach them after the tow-line has separated.

Rescue Plans Tow-Line Separation: (High Wind + Water Landing + Rescue)

Implementing a successful rescue strategy is paramount in any type of water landing. Various rescue strategies have been deployed over the years with minimal success in parasail fatality prevention and fall short of having a significant impact. All of these plans are based on the use of a single or multi passenger harness support system:

1. **Tow Vessel: Ensnare Canopy:** Use: Wide Spread-The most prevalent rescue plan in use today is for the winchboat to overtake and run over the runaway canopy. The distance to parasailor, ground speed of canopy and time to achieve results vs. drowning time assuming the canopy is at water level, greatly reduce the odds of this solution's successful implementation.
2. **Chase Boat: Ensnare Canopy:** Use- Rare -This plan involves operating a second vessel and crew that follows the parasailors throughout the flight with the assumption that it will be better positioned to rescue the parasailor/canopy as needed. While this plan seems viable carrying out this plan may be cost

prohibitive and even dangerous in high parasail flight concentrations such as the Pensacola area.

The rationale behind this plan is the tacit admission that plan 1 'Run Over Canopy' and Plan 3 'Gaff Pole' may not be feasible in terms of the vessel's requirement to overtake the canopy in a timely manner. Thus this plan casts doubt by its endorsers on those two other plans.

3. **'Gaff' Pole:** Use-Very Few -This plan involves a long pole with a 'shepherds hook' on the end. The concept is to chase down and snare the runaway canopy using this device thus in theory preventing it from remaining inflated. The challenges found in the previous plan apply along with false assumption that a single person can snare and deflate a canopy with high lift capability failed in a real life rescue attempt resulting in the death of a parasailor.
4. **'Drogue Style' Devices:** Use- Few -This plan involves a manually activated 'drogue device' deployed by the parasailor and/or crew which acts like a sea anchor attached to the canopy, which when filled with water causes the canopy to sink back into the water. When deployed by the parasailor, it requires the parasailor to locate and pull on the loop handle. In the case of the crew, it requires the tow vessel to chase down the canopy so the crew can engage the loop handle with a gaff pole. All of the challenges given require extensive training and execution by the passengers and crew to carry out this task under extremely stressful and life threatening situations. It also has the danger of pre-emergency deployment in adverse conditions which failed reliability testing in the mid 80's and 90's.

Which Risk Has The Greatest Impact On The Reduction of Fatalities?

Based on existing rescue plans involving specifically the “harness support systems” are for the most part ineffective as none of them prevent or mitigate the three risk factors explained in Tow-Line Separation Risk Factors above i.e. a) canopy re-inflation, b) harness escape and; c) glide/ slope ratio prior to the accident.

While all three risks play a significant role in parasailing deaths, one stands out above the rest. The parasailor’s inability to escape or free themselves from the canopy is the root cause of serious injuries and fatalities to date.

In fact, it is this **‘inability to escape’** which both propagated the many different rescue plans and which has stymied them as well. Why?

1. There is a prevalent use in the US of a body harness passenger support system which is designed to keep the wearer from falling out of or inadvertently escaping the harness. This includes during and after an emergency waterlanding
2. The original full body harness design which connected the passenger to the canopy at the top of the shoulder was modified in the 1980’s and is now referred to as the half body harness and connects the parasailor at the hip. This change of convenience tends to flip the wearer upside down when being dragged backwards through the water.
3. A drowning person especially one being drug through the water is not rational or capable of carrying out any type of instructions or commands. This is supported by numerous studies including one in particular published by the Journal of U. S. Coast Guard Search and Rescue magazine entitled "It Doesn't Look Like They're Drowning" ([View Article](#))

So therein lies the dilemma. A harness which is the parasailor' friend in the sky becomes their enemy in the water. ([Watch Video](#))

NON- TOW LINE SEPARATION ACCIDENTS

Non Tow-Line Separation Accidents while less frequent, have been connected to deaths and serious injuries as well. (See accident in Pompano Beach , Bahamas and Long Boat Key, Ft. Myers) where passenger support system failure was the root cause. These accidents are principally based on mechanical/material failure and negligence. They also involve poor rescue techniques involving a stationary floating passenger.

Based on a review of all significant accidents going back three decades, the non tow-line separation accidents are best eliminated through proper equipment configuration, specific use, and routine maintenance and replacement, including the Winchboat vessel system.

HOW DO WE SOLVE THIS DILEMMA?

It is my professional opinion, based on years of empirical accident data and experience, that we will only achieve the goal of preventing both serious parasail accidents and fatalities by restricting the canopy size based on the type of passenger support system in use.

In fact, if regulators were to implement limitations on canopy size based on equipment types as outlined below, new regulations dealing with parasail accidents and fatality prevention resulting from tow line separations and emergency waterlandings in dangerous wind conditions would be unnecessary.

THIS REGULATION MAY BE SUMMED UP IN TWO WORDS: [RULE 26/44]

The strength of Rule 26/44, is derived from its simplicity and effectiveness. Parasail captains ONLY NEED TO BE REGULATED AS TO THEIR MAXIMUM CANOPY SIZE BASED ON THE PARASAIL PASSENGER SUPPORT SYSTEM THEY ARE USING.

Rule 26/44 would be easy to regulate and inexpensive to adopt and enforce. It requires no experience, no specialized training or reliance on any other type of equipment that creates additional duties, burdens and liability to the operator and parasailor. Simply stated, Rule 26/44 eliminates these problematic areas.

SUMMARY OF THE RULE 26/44 PROPOSAL

To prevent future parasail fatalities, the RULE 26/44 provision that places restrictions on Passenger Support Systems and Canopy size should be included with any new commercial parasailing regulations.

Passenger Support System:

1. Under rule 26/44, all parasail vessels must be equipped with a passenger support system that includes a “harness style” and/or "gondola style" systems or both.

Canopy Diameter Restrictions:

2. Under rule 26/44, the maximum diameter of Parasail canopies used for commercial parasailing must be not exceed 26’ feet for the harness style passenger support system and 44’ feet for the Gondola passenger support system.

THE SCIENCE BEHIND RULE 26/44

A combination of wind speed, payload and canopy size have a direct correlation as to the probability of a parasailor drowning as the result of emergency waterlandings in high winds after a tow line separation. The totality and complexity of this scenario makes regulating these variables, extremely difficult, if not impossible to draft, operators to comply with and their enforcement.

Placing restrictions on canopy size is the key to waterlanding survival especially for 'harness' flights because parasailor(s) are irrevocably attached to the harness/canopy system.

We know that the flight characteristics of a 26' foot canopy in that it will not fully re-inflate before self-deflating given any pay load above 90lbs in wind speeds up to 30 knots. As such, the likelihood of a 'harness' drowning as the result of a 26' runaway canopy is less than 0.01%.

Unlike the harness, the gondola style support system, which surrounds parasailor(s) in a protective frame without physical restraints, allows for easy evacuation from a reclined position in the event of a waterlanding even in winds speeds exceeding 30 knots, thus the larger allowable canopy size of up to 44' feet without endangering the parasailors.

CONCLUSION

The sport as presently practiced commercially. We can conclude from statistics, accident reconstruction and imperial data that preventing injury or death to a parasailor

in the Tow-Line Separation: (High Wind + Water Landing) accident category, would have a significant impact on the reduction of this risk! Theoretically we have found that solving these factors and preventing serious injuries and deaths may be simpler than we have been lead to believe. The real question is no longer whether there can be effective regulations. The real question is who has the wisdom to implement them.

NOTES TO THE RULE:

This rule did not consider any devices including those that are labeled and/or marketed as parasail safety products that have not been tested and validated by a certified engineering firm and which have not meet the minimum requirements for product liability insurance underwriting

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For more resources regarding parasail accidents and statistics, please visit

<http://www.parasail.org/accident-statistics.html>