



# UNITED STATES COAST GUARD

---

**REPORT OF INVESTIGATION INTO THE  
CIRCUMSTANCES SURROUNDING THE INCIDENT  
INVOLVING  
M/V WHY KNOT  
PERSONAL INJURY**

**ON 07/01/2013**



**MISLE ACTIVITY NUMBER: 4639545  
ORIGINATING UNIT: SECTOR MOBILE  
MISLE ACTIVITY OWNER: MARINE SAFETY DETACHMENT PANAMA CITY  
MISLE ACTIVITY CONTROLLER: MARINE SAFETY DETACHMENT PANAMA CITY  
MISLE CASE NUMBER: 643619**

U.S. Department of  
Homeland Security

United States  
Coast Guard



Commandant  
United States Coast Guard

US Coast Guard Stop 7501  
2703 Martin Luther King Jr. Ave. SE  
Washington, DC 20593-7501  
Staff Symbol: CG-INV  
Phone: (202) 372-1032  
Fax: (202) 372-1904

16732/IIA #4639545  
17 June 2022

**MATERIAL FAILURE WITH PASSENGER INJURIES OCCURRING ON THE  
UNINSPECTED PASSENGER VESSEL WHY KNOT NEAR PANAMA CITY BEACH,  
FLORIDA ON JULY 01, 2013**

**ACTION BY THE COMMANDANT**

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, conclusions, and recommendations are approved subject to the following comments. This marine casualty investigation is closed.

**ACTION ON RECOMMENDATIONS**

**Recommendation 1:** It is recommended that the Commandant of the Coast Guard, in consultation with national parasailing organizations and/or parasailing industry, use its discretion afforded in 46 USC 7101 to develop a distinct parasail rating endorsement and require parasail operators that operate either inspected or un-inspected parasail vessels, to hold such an endorsement when conducting parasail operations. In light of the Coast Guard's efforts to encourage the development of industry consensus standards for parasail operations, such as the current efforts of ASTM International, Commandant should consider and gage the success of the industry's efforts to improve parasail safety without additional Federal Regulation. If future analysis and evaluation of industry consensus standards show the standards fail to address latent unsafe conditions, parasail casualties continue, and operators fail to follow voluntary standards, as was the case in this marine casualty, the Coast Guard may consider establishing licensing requirements that require parasail operators to demonstrate their ability to conduct proper parasail operations.

**Recommendation 2:** It is recommended that the Commandant of the Coast Guard research and consider developing regulations regarding parasail operations or inspect parasail equipment on all parasail vessels that carry at least one passenger for hire. Understanding that the Coast Guard would have to seek legislative and regulatory authority such action for uninspected passenger vessels, and ASTM is currently developing consensus standards for the parasail industry; Commandant should consider the rate of casualties occurring on parasail vessels as compared to other commercial operations, and consider the effectiveness of industries' implementation of ASTM's parasail standards. If Commandant were to develop such regulations, Commandant could consider incorporating the ASTM standards by reference if deemed sufficient and effective. Further, considering that accidents occur due to organizational system faults and not

specifically linked to one person, the Coast Guard can effectively promote parasail safety through a systems approach that applies enforceable regulations industry wide. Regulations would proactively address known latent unsafe conditions, and guide, encourage, and compel parasail companies, its owners and operators, to promote safety.

**Recommendation 3:** It is recommended that the Commandant of the Coast Guard continue to promote parasail safety under existing statutory authorities. Efforts include continued involvement in the development of voluntary consensus standards initiatives of ASTM International and industry stakeholders, and existing education and outreach efforts to educate parasail operators.

**Recommendation 4:** It is recommended that the Commandant of the Coast Guard issue a safety alert or a marine inspection notice that reflects key findings of this report. The safety alert or marine inspection notice should encourage all parasail vessel operators to:

- Pay special attention to the prevailing and forecasted weather conditions, and utilize all available means in making weather related assessments, including NWS web pages,
- Consult industry representatives to ensure that maximum parasail canopy size does not exceed the manufacturers recommendations for the winch on a vessel,
- Consult operational manuals and understand the operational characteristics of the parasail winch system, including the inverse relationship of engine RPM to torque,
- Conduct parasail operations at locations further offshore to allow greater sea room to respond to high wind situations,
- Connect the parasail towline to the parasail yoke with a means that helps maintain the full breaking strength of the line. Operators should consider alternative to the typical bowline knot, which reduces line strength by as much as 40%, including installation of chaffing devices such as metal hardware (D-rings) or a thimble in the formed eye of the line, and the use of appropriate knots, such as a double figure eight knot or splices that provide greater reliability and strength.
- Implement established voluntary industry standards, such as the parasail standards developed by ASTM and WSIA, and
- Ensure proper maintenance of all parasail equipment, with particular focus on ensuring all securing A-Frame u-bolt nuts have a means to prevent loosening or backing, and all winch hydraulic lines and systems are leak free and in good working order.

**Recommendation 5:** It is recommended that Sector Mobile Inspections Division develop and issue a Marine Safety Information Bulletin (MSIB) regarding the key findings of this report. The MSIB should encourage all parasail vessel operators to follow those items listed in paragraph 4 above.

**Recommendation 6:** It is recommended that Sector Mobile Inspections Division continue to execute its education and outreach programs to promote parasail safety. Such efforts should incorporate published Coast Guard MSIB and Safety Alerts during discussions with parasail

operators when conducting routine small passenger vessel inspections and dockside walks. Leveraging participation by the Coast Guard Auxiliary is highly encouraged.

**Recommendations 1-22:** I concur with the intent of these recommendations. The Coast Guard currently lacks regulatory authority to compel compliance with regard to parasailing operations, equipment, or parasail specific endorsements for merchant mariner licensing. However, since 2009, the Coast Guard has shepherded the development of consensus standards with Industry stakeholders including the Water Sports Industry Association (WSIA).

In January 2012, the Coast Guard requested that stakeholders and WSIA develop voluntary standards for the parasailing industry using the American Society for Testing and Materials (ASTM) consensus standards process. A subcommittee was formally established in the fall of 2012, and the first ASTM standards were published in April 2013.

The ASTM "Standard Practices for Parasailing" continue to be reviewed and have undergone multiple revisions over the past nine years, the most recent version being F3099-19. The parasail industry has taken extensive action towards improving operational safety. Key elements of the standard are: Weather Monitoring and Limits, Equipment, Towline Care, Operations, Crew Requirements, Emergency Procedures, and Patron Responsibility. The Coast Guard continues to monitor the industry's implementation of the ASTM standards and evaluate their effectiveness. This is completed through Coast Guard presence at annual parasailing conferences and engagement with the Water Sports Industry Association (WSIA) and by periodically providing casualty data to measure ASTM standard effectiveness.

Since 2009, the Coast Guard has issued multiple Safety Alerts and Marine Safety Information Bulletins (MSIBs) to the public, which are specific to the parasailing industry and include the following:

- 2009: 06-09 Safety Alert 'Parasailing Incidents'
- 2011: 05-11 Safety Alert 'Parasailing: Know your Ropes'
- 2012: The Commandant sent message (R 191851Z Jan 12) regarding commercial parasailing vessel safety and included the "Commercial Parasailing Vessel Safety Guidance," which prescribes how outreach to parasail operators should be conducted by Coast Guard units.
- 2013: 07-13 Safety Alert 'Parasailing Operations – Know Your Ropes (2)'
- 2014: 05-14 Safety Alert 'Overheating of Parasailing Vessel Hydraulic System'
- 2015: MSIB 003-15 'Parasailing - Flight Safety and Rules'
- 2015: 07-15 Safety Alert 'Prevent Parasail Accidents: Follow ASTM Standards and Follow Manufacturer Instructions!'
- 2018: 12-18 Safety Alert 'Hazards of Parasail and Watersport Passenger Transfers'
- 2019: MSIB 002-19 'Parasailing - Navigation Rules and Flight Safety'

A hazardous condition is any condition that may adversely affect the safety of any vessel, bridge, structure, or shore area or the environmental quality of any port, harbor, or navigable waterway of the United States. In July 2015, the U.S. Coast Guard issued Navigation and Vessel Inspection Circular (NVIC) 1-15, "TITLE 46, CODE OF FEDERAL REGULATIONS (CFR), PART 4 MARINE CASUALTY REPORTING PROCEDURES GUIDE WITH ASSOCIATED STANDARD INTERPRETATIONS." NVIC 1-15 clarifies that parasailing accidents not reaching reportable marine casualty thresholds in 46 CFR § 4.05-1 would still constitute a hazardous condition as defined in 33 CFR 160.202 and meet the subsequent reporting requirement of hazardous conditions as defined in 33 CFR §160.216.


In 2015, U.S. Coast Guard Training Center Yorktown added a parasail casualty scenario to the Investigating Officer Course curriculum. This scenario offers Coast Guard Investigators the opportunity to consider the unique investigation considerations associated with parasail operations.

Since this incident occurred, parasailing fatalities and injuries have declined. The Coast Guard will continue to monitor parasail safety and encourage the combined efforts of stakeholders to improve safety.

Through safety initiatives in public education and outreach, established ASTM standards, and continued partnership with WSIA and ASTM representatives, it is clear that the intent of these recommendations has been addressed as is evidenced through the downward trends in casualties. The closure of this case will allow the Coast Guard to share it and any third party safety recommendations with our parasailing industry partners to further strengthen safety measures within the parasailing industry.


This report, along with similar parasailing cases, will be posted and available to the public on the DCO website here:

[https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Office-of-Investigations-Casualty-Analysis/Marine-Casualty-Reports/.](https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Office-of-Investigations-Casualty-Analysis/Marine-Casualty-Reports/)

  
J. D. NEUBAUER  
Captain, U.S. Coast Guard  
Acting Director of Inspections and Compliance

16732  
5 April 2018

FIRST ENDORSEMENT on CG SECTOR Mobile Memo 16732 of 9 Jun 2014

  
From: T. J. KAMINSKI, CAPT  
CGD EIGHT (dp)  
To: COMDT (CG-INV)  
Subj: PARASAIL VESSEL WHY KNOT, PERSONAL INJURIES, REPORT OF INVESTIGATION

I have reviewed and am forwarding the Investigating Officer's report, recommending approval. I partially concur with the Investigating Officer's Safety Recommendations, with the following amplifying comments:

Recommendation 1: It is recommended that the Commandant of the Coast Guard, in consultation with national parasailing organizations and/or parasailing industry, use its discretion afforded in 46 USC 7101 to develop a distinct parasail endorsement and require parasail operators that operate either inspected or un-inspected parasail vessels, to hold such an endorsement when conducting parasail operations. In light of the Coast Guard's efforts to encourage the development of industry consensus standards for parasail operations, such as the current efforts of ASTM International, Commandant should consider and gage the success of the industry's efforts to improve parasail safety without additional Federal Regulation. If future analysis and evaluation of industry consensus standards show the standards fail to address latent unsafe conditions, parasail casualties continue, and operators fail to follow voluntary standards, as was the case in this marine casualty, the Coast Guard may consider establishing licensing requirements that require parasail operators to demonstrate their ability to conduct proper parasail operations.

D8 Comment on Recommendation 1: I concur with this recommendation. Each credentialed officer must become familiar with the relevant characteristics of a vessel prior to assuming duties as required by 46 CFR 15.405. I recommend the National Maritime Center (NMC), ASTM International, and national parasailing organizations require all licensed parasail vessel operators to hold a parasail endorsement.

Recommendation 2: It is recommended that the Commandant of the Coast Guard research and consider developing regulations regarding parasail operations or inspect parasail equipment on all parasail vessels that carry at least one passenger for hire. Understanding that the Coast Guard would have to seek legislative and regulatory authority such action for uninspected passenger vessels, and ASTM is currently developing consensus standards for the parasail industry; Commandant should consider the rate of casualties occurring on parasail vessels as compared to other commercial operations, and consider the effectiveness of industries' implementation of ASTM's parasail standards. If Commandant were to develop such regulations, Commandant could consider incorporating the ASTM standards by reference if deemed sufficient and effective. Further, considering that accidents occur due to organizational system faults and not specifically linked to one person, the Coast Guard can effectively promote parasail safety through a systems approach that applies enforceable regulations industry wide.

Regulations would proactively address known latent unsafe conditions, and guide, encourage, and compel parasail companies, its owners and operators, to promote safety.

D8 Comment on Recommendation 2: I concur with the intent of this recommendation, however, ASTM completed and published voluntary standards for parasailing operations. The “Standard Practices for Parasailing” (F3099) provides guidelines and procedures for the operation, maintenance, and inspection of parasail vessels, equipment, and associated activities. The standards include crew training for flying passengers aloft in a parasail, increased tensile strength standards for parasail tow lines, and the addition of a wind variance for trade wind locations to compensate for wind unpredictability in certain regions. As such, there is no action necessary at the COMDT level.

Recommendation 3: It is recommended that the Commandant of the Coast Guard continue to promote parasail safety under existing statutory authorities. Efforts include continued involvement in the development of voluntary consensus standards initiatives of ASTM International and industry stakeholders, and existing education and outreach efforts to educate parasail operators.

D8 Comment on Recommendation 3: I concur with this recommendation. Three Marine Safety Alerts (06-09, 05-11, and 07-13) detailed safety concerns associated with parasailing activities and encouraged owners, operators and parasail industry associations to develop safe operating standards to minimize injuries and deaths. I recommend the Marine Safety Center (CG-MSA) and the Office of Commercial Vessel Compliance (CG-CVC) maintain an outreach program to promote the adoption of ASTM’s “Standard Practices for Parasailing” (F3099). Also, I recommend OCMI/COTPs engage in outreach efforts, including dissemination of Marine Safety Information Bulletins (MSIBs), within their AORs to increase awareness, and adoption of parasailing safe work practices.

Recommendation 4: It is recommended that the Commandant of the Coast Guard issue a safety alert or a marine inspection notice that reflects key findings of this report. The safety alert or marine inspection notice should encourage all parasail vessel operators to:

- a. Pay special attention to the prevailing and forecasted weather conditions, and utilize all available means in making weather related assessments, including NWS web pages,
- b. Consult industry representatives to ensure that maximum parasail canopy size does not exceed the manufacturer’s recommendations for the winch on a vessel,
- c. Consult operational manuals and understand the operational characteristics of the parasail winch system, including the inverse relationship of engine RPM to torque,
- d. Conduct parasail operations at locations further offshore to allow greater sea room to respond to high wind situations,
- e. Connect the parasail towline to the parasail yoke with a means that helps maintain the full breaking strength of the line. Operators should consider alternative to the typical bowline knot, which reduces line strength by as much as 40%, including installation of chaffing devices such as metal hardware (D-

rings) or a thimble in the formed eye of the line, and the use of appropriate knots, such as a double figure eight knot or splices that provide greater reliability and strength.

f. Implement established voluntary industry standards, such as the parasail standards developed by ASTM and WSIA, and

g. Ensure proper maintenance of all parasail equipment, with particular focus on ensuring all securing A-Frame U-bolt nuts have a means to prevent loosening or backing, and all winch hydraulic lines and systems are leak free and in good working order.

D8 Comment on Recommendation 4: I concur with this recommendation. See comments on recommendation 3.

Recommendation 5: It is recommended that Sector Mobile Inspections Division develop and issue a Marine Safety Information Bulletin (MSIB) regarding key findings of this report. The MSIB should encourage all parasail vessel operators to follow those items listed in paragraph 4 above.

D8 Comment on Recommendation 5: CG Sector Mobile completed this recommendation. There is no action necessary at the COMDT level.

Recommendation 6: It is recommended that Sector Mobile Inspections Division continue to execute its education and outreach program to promote parasail safety. Such efforts should incorporate published Coast Guard MSIB and Safety Alerts during discussions with parasail operators when conducting routine small passenger vessel inspections and dockside walks. Leveraging participation by the Coast Guard Auxiliary is highly encouraged.

D8 Comment on Recommendation 6: CG Sector Mobile continues to carry out this recommendation. There is no action necessary at the COMDT level.

#

Copy: CG SECTOR Mobile



U.S. Department of  
Homeland Security

United States  
Coast Guard



Commander  
U.S. Coast Guard Sector

1500 15<sup>th</sup> Street  
Mobile, AL 36615  
Staff Symbol: sp  
Phone: (251)441-5999  
Fax: (251)441-5682

16732  
9 JUN 2014

## MEMORANDUM

From: [REDACTED]  
S. Walker, CAPT  
CG SECTOR (s)

Reply to [REDACTED]  
Attn of: [REDACTED]

To: COMDT (CG-INV)  
Thru: CGD EIGHT (dp)

Subj: PARASAIL VESSEL WHY KNOT, PERSONAL INJURIES,  
REPORT OF INVESTIGATION

Ref: (a) Title 46 United States Code, Chapter 63  
(b) Title 46 Code of Federal Regulations, Part 4  
(c) Marine Safety Manual Volume V, COMDTINST M16000.10A

1. In accordance with the above references, my office conducted an investigation into the tragic July 1, 2013 marine casualty onboard the subject parasail vessel, resulting in two teenage girls sustain critical injuries. Attached please find the resulting Report of Investigation (ROI).
2. Following my review of the ROI, I concur with the Findings of Fact, Analysis, Conclusions, and Recommendations.
3. My office has already taken action on Safety Recommendation number 5 and on Enforcement Recommendation number 1.

#

Encl: (1) Report of Investigation dated 14 APR 2014.

U.S. Department of  
Homeland Security

United States  
Coast Guard



Commander  
U.S. Coast Guard Sector Mobile

1500 15<sup>th</sup> Street  
Mobile, AL 36615  
Staff Symbol: sp  
Phone: (251)441-5999  
Fax: (251)441-5682  
Email: scott.w.muller@uscg.mil

16732  
14 APR 2014

## MEMORANDUM

From: [REDACTED]  
S. W. Muller,  
CG Sector Mobile (sp)

To: CG Sector Mobile (s)  
Thru: CG Sector Mobile (sd)

Subj: PARASAIL VESSEL WHY KNOT, PERSONAL INJURIES,  
REPORT OF INVESTIGATION.

Ref: (a) Marine Safety Manual Volume V, COMDTINST M16000.10A  
(b) Marine Casualty Report of Investigation (ROI) Policy, CG-545 Policy Letter 1-11  
(c) Report of Investigation - TIED HIGH Parasailing Accident and subsequent loss of two lives investigation, CG-545 dated 24 OCT 2011

### Executive Summary:

On 01 JUL 2013, at approximately 1540, the uninspected passenger vessel WHY KNOT, with six passengers for hire and two crewmembers, was underway conducting commercial parasail operations off Panama City Beach, Gulf of Mexico. Skies were cloudy with Southerly winds and a dark storm front visible offshore from the beach. With two parasail riders aloft, the winds rapidly increased to 14 mph sustained with gusts in excess of 20 mph. During the Master's attempts to retrieve the aloft parasail riders, the prevailing weather conditions overcame the winch's ability to retrieve the towline and parasail. The vessel subsequently lost forward momentum and the force of the wind on the parasail pulled the vessel stern first toward the beach. At approximately 1559, the towline parted at the bowline knot used to secure the line to the parasail. The wind then carried the parasail and the two riders over the beach and into a Condominium's 12<sup>th</sup> floor balcony. The wind continued to carry the parasail and its riders over the building where the shrouds of the parasail hit power lines on the adjacent roadway. The momentum and wind carried the riders into a parking lot and crash-landed them into the top of a parked vehicle. Emergency medical services transported both seriously injured passengers to Bay Medical Center in Panama City, FL. Within two weeks, both passengers moved to hospitals closer to their homes for long-term rehabilitation. Marine Safety Detachment (MSD) Panama City conducted a marine casualty investigation under MISLE Activity # 4639545 and produced this Report of Investigation (ROI) in accordance with references (a) and (b).

This ROI draws from reference (c), a ROI of a similar parasail accident that occurred on 28 AUG 2009. It offers outstanding background and detail pertaining to parasail operations, a listing of safety recommendations, and the Coast Guard's current initiatives to promote parasail safety.

**Vessel Data:**



Name	WHY KNOT
Official Number	FL1001KL
Hailing Port	Panama City, FL
Service	Passenger (Uninspected)
Year Built	1998
Owner	Aquatic Adventures
Length (FT)	28
Propulsion	Gasoline Inboard/Outboard

**WHY KNOT Personnel Data:**

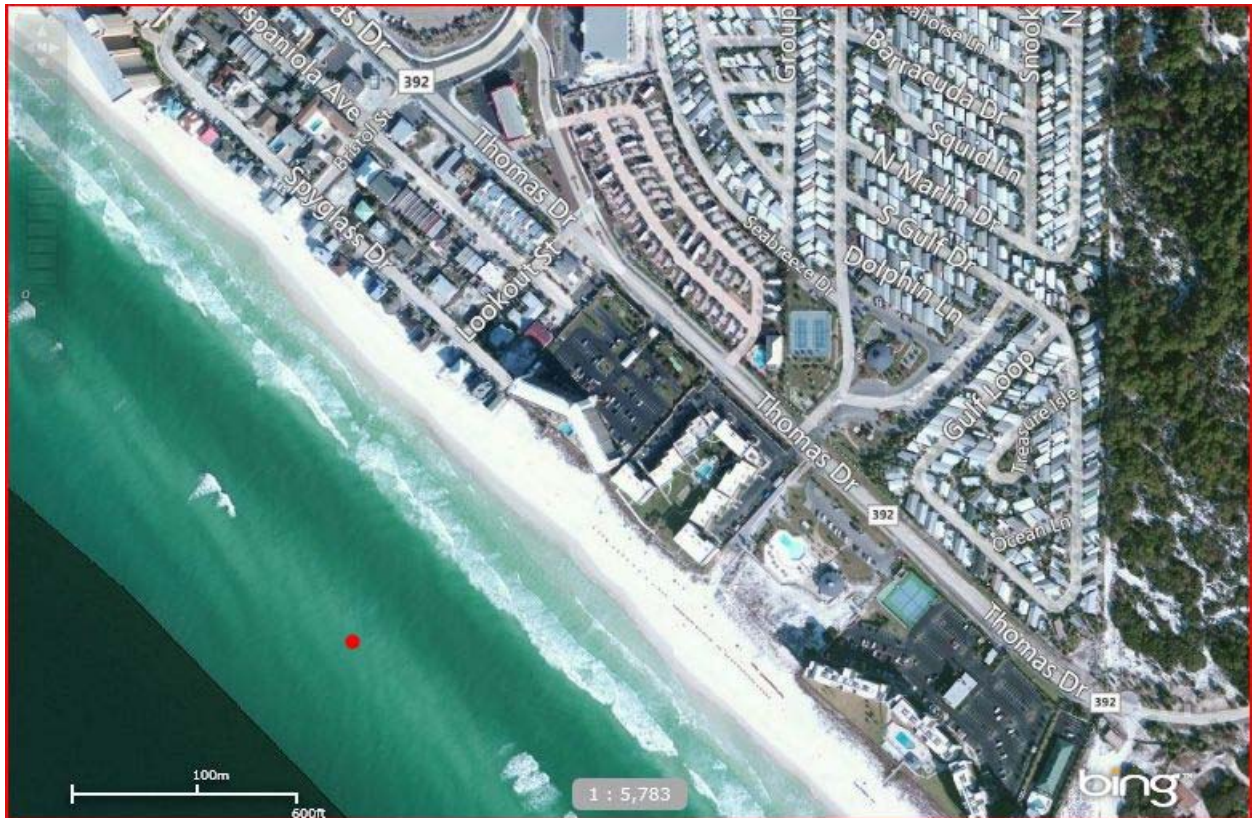
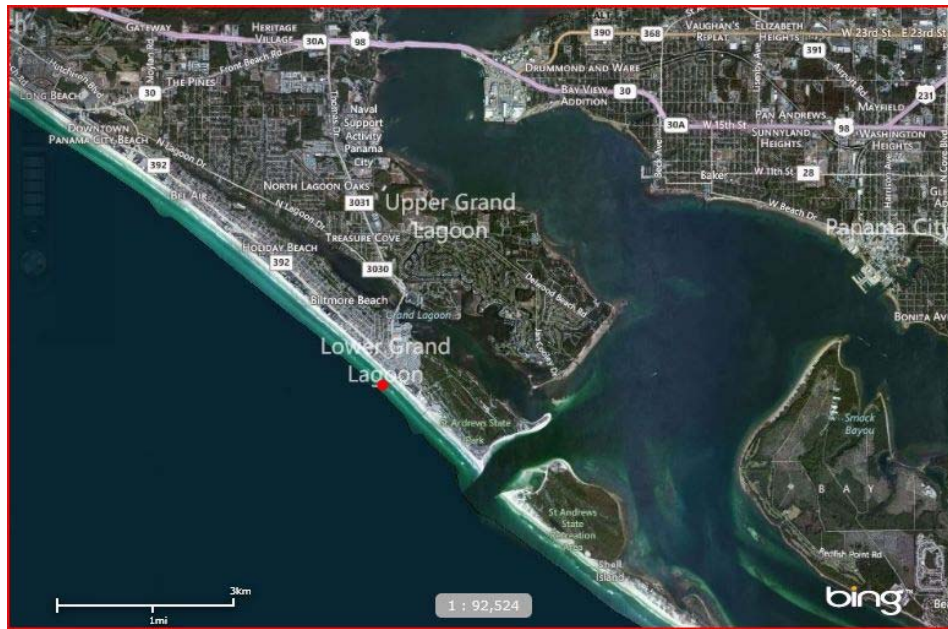
Crewmembers	Age	Total Experience	WHY KNOT Experience	Position
[REDACTED]	[REDACTED]	6 years	Relief Captain	Master
[REDACTED]	[REDACTED]	3.5 years	2 years	Deckhand

The investigators instructed the vessel owner to complete drug and alcohol testing on both Master and crewmember. All tested negative for the presence of alcohol and/or drugs.

**WHY KNOT Passenger Data:**

Name	Age	Position	Status
[REDACTED]	[REDACTED]	Passenger	At risk, Not injured
[REDACTED]	[REDACTED]	Passenger	At risk, Not injured
[REDACTED]	[REDACTED]	Passenger	At risk, Not injured
[REDACTED]	[REDACTED]	Passenger	At risk, Not Injured
[REDACTED]	[REDACTED]	Passenger	Injured
[REDACTED]	[REDACTED]	Passenger	Injured

**Location of Casualty:** Panama City Beach, Florida

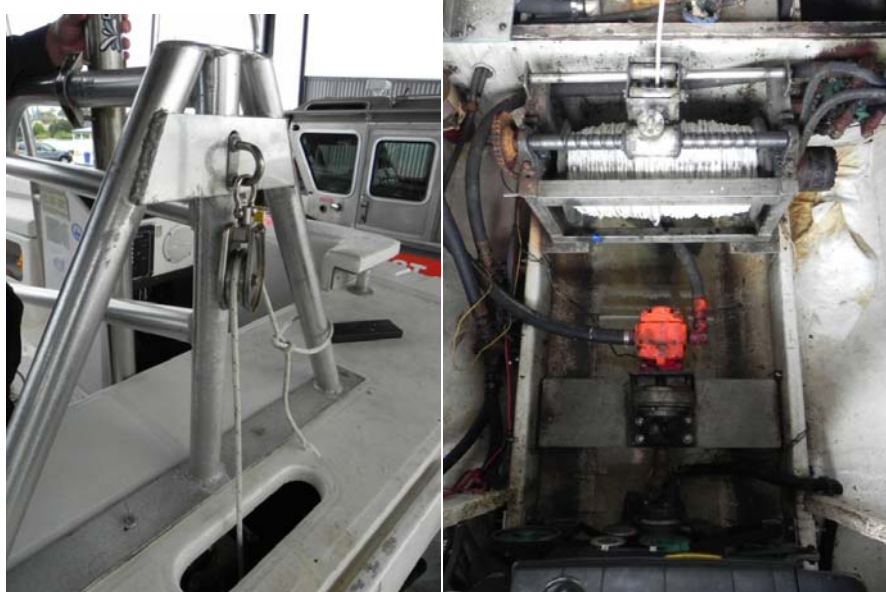


Approximately 1.25 miles West of St Andrews Pass, Panama City Beach, Florida

**Findings of Fact:**

1. The WHY KNOT is a Premium 1998, 28-foot, FRP (Fiberglass Reinforced Plastic) hulled uninspected small passenger vessel (UPV).
2. The regulatory requirements applicable to and governing the WHY KNOT are Title 46 Code of Federal Regulations (CFR) SUBCHAPTER C-UNINSPECTED VESSELS. Title 46 CFR applies to the vessel. Currently, there are no federal or state regulations that specifically pertain to parasail equipment, operations or licensing.
3. Captain [REDACTED], the Master of the vessel, holds a Coast Guard issued Merchant Mariner Credential: [REDACTED]. This credential is for Uninspected Passenger Vessel operations. Captain [REDACTED] has worked for Aquatic Adventures for 1.5 years. During that time, he served as a Master onboard personal watercraft pulling banana boats and as a crewmember on parasail vessels.
4. The deckhand, crewmember [REDACTED], does not hold a Coast Guard issued license or document, nor do the laws and regulations require a deckhands to hold one.
5. The WHY KNOT's owner, Aquatic Adventures, also owns 10 parasail vessels in Panama City Beach Florida.
6. Aquatic Adventures pays the captains of parasail vessels on commission based on the number of parasail flights in a day, and pays its crewmembers based on the number of hours worked in a week.
7. While Aquatic Adventures is not a member of a parasail organization, its safety officer was a participating member on the ASTM International's weather standard committee.
8. Aquatic Adventures uses the Water Sports Industry Association (WSIA) Parasail Training Manual dated 2010 as part of its vessel captain training program. The WSIA Parasail Training Manual contains information on parasail equipment and operations, including discussion on maximum wind speed and wave height, proximity to shore, parasail flight theory, emergency procedures, and captain and crew operational skills.
9. On 17 APR 2013, Captain [REDACTED] completed company training utilizing the WSIA Parasail Training Manual. He signed each page of the manual and Aquatic Adventures Employee Training worksheet, which reflects key elements of the WSIA Parasail Training Manual, including maintaining a weather log and monitoring weather conditions.
10. This was Captain [REDACTED] first day as a Relief Captain for the WHY KNOT. Captain [REDACTED] normally serves as the Master of the M/V AIRGASM. M/V AIRGASM is also a 28-foot parasail vessel from the same vessel manufacturer. Vessel configuration and parasail operations configuration are the same for both vessels.

11. The WHY KNOT uses an aluminum A-frame system to conduct its parasail operations. The A-frame consists of a pulley that connects the parasail towline from the parasail apparatus through a hole in the deck to the parasail towline drum and winch.



Left: View of the Pulley and A-Frame. Right: View of winch and hydraulic motor that controls the winch drum from the main deck, looking down toward the front of the vessel.



Vessel steering station with winch control

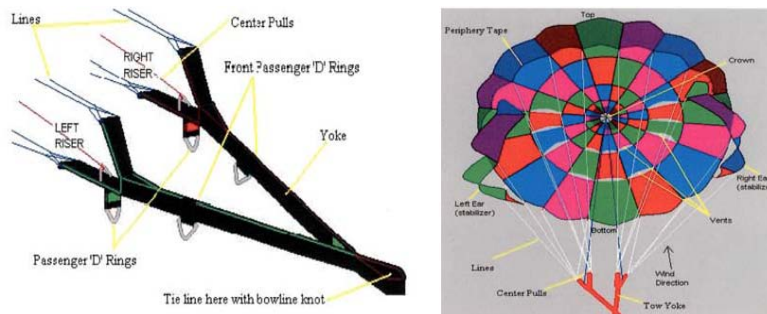
12. The WHY KNOT's installed parasail towline was a 1,000 foot, 3/8 inch high performance double braided polyester rope. According to the lines specification sheet, the line is made from high tenacity polyester with a minim tensile strength of 4,275 pounds, breaking tenacity of 9.1 Grams Per Denier, and 14% elongation. In June 2013, Aquatic Adventures purchased and installed the line from Paradise Water Sports, whom purchased the line in February 2013 from Custom Cordage, whom obtained the line from Phoenix Rope and Cordage Co.

13. According to the Captain [REDACTED], he attached the parasail towline to the parasail yoke using a bowline knot with three half hitches.

14. The WHY KNOT's installed parasail was designed and manufactured by Custom Chutes, Incorporated. Custom Chutes manufactures several different sizes of parasail canopies with varying wind speed and passenger weight limitations.

15. A Custom Chutes manufacturer's label affixed to the parasail canopy involved in the marine casualty identifies it as a 39-foot parasail. It was manufactured in June, 2012, serial number 06122895, and is designed to operate for a passenger weight load between 150 and 560 pounds and in winds not greater than 12 m.p.h. with air management zippers closed and 14 m.p.h. with air management zippers open.

16. The yoke and riser assembly consists of three layers of two-inch polyester webbing connected to the parasail by 16, 7/32-inch polyester shroud lines. The parasail towline connects to the yoke with a bowline knot.



Parasail harness and assembly



Left: Label from the Custom Chute involved in the marine casualty.  
Right: Chute in use just prior to the casualty.

17. On 01 JUL 2013 at approximately 0800, the WHY KNOT departed from Lagoon Motel dock in Panama City Beach, Florida, with Captain [REDACTED] and deckhand [REDACTED] to begin parasail operations in the Gulf of Mexico. Prior to departure, the Master and deckhand conducted a visual check of the parasail equipment and found the equipment was in good order. They logged their findings in the vessel's "daily maintenance log." Under the section for "winch inspection", they indicated the Hydraulic fluid was half-full.

18. Mariners, including parasail operators and shore-side support, can easily access National Weather Service (NWS) Forecasts and receive advisories and warnings from a number of sources. Mariners can view NWS websites (Weather.gov), monitor the NOAA Weather Radio available on many VHF marine band radios, and Smartphone's (mobile.weather.gov).

19. On 01 JUL 2013, the WHY KNOT was equipped with an operational VHF Marine Band Radio capable of receiving special weather broadcasts. The radio was energized and operational. However, Aquatic Adventures employees and parasail vessel operators relied on the use of handheld radio to collaborate on parasail operations and communicate weather conditions.



VHF Marine radio with weather channel, located in the steering console

20. At 1033, The National Weather Service (NWS) Tallahassee office documented the following weather synopsis for the Suwannee River to Destin out to 60 NM:

Synopsis...Moderate southerly flow is forecast to continue over the coastal waters through much of this week as the region remains situated between low pressure to the west and high pressure to the east. Scattered to numerous showers and thunderstorms will also continue through the week.

21. At 1033, the NWS Tallahassee office documented the following coast water weather forecast:

Coastal waters from Apalachicola to Destin FL out 20 NM...Today...Southwest wind around 10 knts. Seas 2 to 3 Feet. Protected waters smooth to a light chop. A chance of showers and thunderstorms. Tonight...Southwest wind 10 to 15 knots. Seas 2 to 4 Feet. Protected waters a light to moderate chop. A chance of showers and thunderstorms.



22. At approximately 1305, NWS Tallahassee issued the following Special Warning:

Special Marine Warning for Coastal waters from Inlet Beach to Panam City Beach FL out to 20 NM over the Gulf of Mexico Until 200 PM CDT. "At 102 CDT, The National Weather Service Detected a Thunderstorm capable of producing winds in excess of 34 mph and a waterspout about 8 NM southwest of Laguna Beach, moving Northeast at 15 mph. Mariners can expect strong winds, high waves, dangerous lighting and heavy rains. Boaters should seek safe harbor immediately, until the storm passes."

23. Captain [REDACTED] did not check the marine radio for weather updates. However, he did log the weather in the "Captain's daily weather log." While he did not log specific times of his observations, his "AM" and "Mid-day" weather observations stated: wind speed - 10, current weather - scattered showers, clouds - partly, seas - 1-3. His "PM" observation indicted: wind speed - 5, current weather - scattered showers, clouds - partly, seas - 1-3.

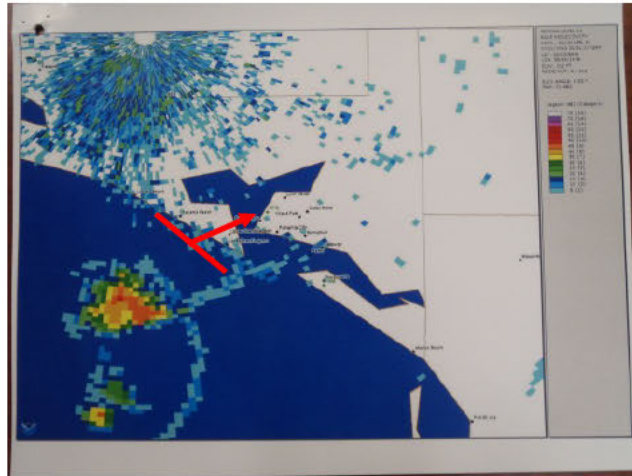
24. Parasail operators from other companies also logged their weather observations. Operators from Coastal Parasail Inc. logged "SW wind AM around 5-10 kts 1 foot seas partly cloudy. Afternoon wind 15-25 kts with squalls shutdown early. Got a call informing me of bad weather approaching. I had already shut down because I could see it coming from offshore." An operator from Panama City parasail logged: "overcast-weather keeps trying to set in... looked completely clear, then crazy wind out of know where. Waited till 3pm, 1<sup>st</sup> boat out, watching weather/pulled chute in around 4pm."

25. At 1340, Captain [REDACTED] terminated parasail operations due to inclement weather.

26. Other parasail companies, Coastal Parasail and Panama City Parasail shut down operations due to weather. Coastal Parasail did not reopen on 01 JUL 2013. Panama City Parasail closed about 1330 due to weather. Panama City Parasail re-opened, but shut down operations prior to 1600 due to incoming weather.

27. At approximately 1520, WHY KNOT resumed parasail operations, conducting two separate tandem parasail flights without incident. Noting "nominal wind conditions", Captain [REDACTED] switched from a smaller parasail to the larger Custom Chutes 39 foot parasail. Captain [REDACTED] tied the knot that connected the parasail line to the harness. He described the knot he tied as a bowline with two half hitches.

28. At 1531, weather radar images provided by NOAA show another storm cell located approximately 4 miles from the coastline moving North East towards the Panama City Beach.



Weather picture obtained from NOAA National Climatic Data Center for 1531 on 01 JUL 2013

29. At 1525, Mr. [REDACTED] took photos prior to passengers [REDACTED] and [REDACTED] leaving the beach. Dark clouds from the storm cell moving in offshore are clearly visible from the beach where the passengers awaited to board the parasail vessel.



Photos taken by [REDACTED] prior to passengers leaving the beach.

30. At 1541, the group consisting of passengers [REDACTED] and [REDACTED] and [REDACTED] arrive at the WHY KNOT. When the passengers arrived on the vessel, crewmember [REDACTED] was wearing a rain jacket and informed the passengers that they “might get a little wet from the rain, but it would be okay.”



Arrival to the WHY KNOT via banana boat pulled by a personal watercraft with [REDACTED] and [REDACTED] and [REDACTED]

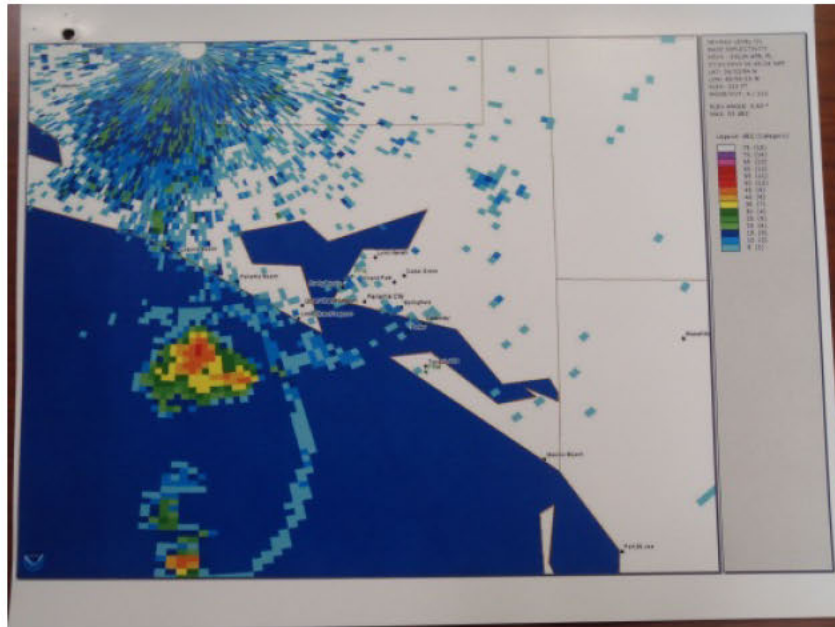
31. Once the group arrived on the WHY KNOT, crewmember [REDACTED] told the group to move forward and sit on the forward bench seats. According to all statements, neither the Captain nor crewmember [REDACTED] conducted a vessel safety brief as required in 46 CFR 26.03-1.



Photo taken from hotel room of WHY KNOT shortly after passengers [REDACTED] and [REDACTED] and [REDACTED] transferred from the banana boat and onto the WHY KNOT.

32. Shortly after the first group of passengers took their seats, another group containing passengers [REDACTED] and [REDACTED] and [REDACTED] arrived at the WHY KNOT on a banana boat. As the new group moved forward to their seats, crewmember [REDACTED] strapped [REDACTED] [REDACTED] and [REDACTED] into the parasail harness apparatus.

33. At a 1545, NOAA weather radar shows the storm moving closer to Panama City.



Weather picture obtained from NOAA National Climatic Data Center for 1545 on July 1, 2013

30. At approximately 1546, passengers [REDACTED] and [REDACTED] begin their parasail ride. Captain [REDACTED] reeled out approximately 800 feet of line and towed the pair of passengers in flight for approximately 14 minutes.



[REDACTED] and [REDACTED] at beginning of parasail flight at approximately 1546.

31. At approximately 1550, Photo Taken by [REDACTED], a bystander on the beach, shows the parasail afloat with the storm front moving into the WHY KNOT's operational area.



[REDACTED] and [REDACTED] aloft at approximately 1550. Photo taken from the beach.

32. Near the end of the flight, the Master lowered and "dipped" the passengers into the water twice before he commenced reeling the passengers aboard the WHY KNOT. Dipping is the procedure of reducing vessel speed to eliminate lift to the parasail resulting in the passengers slowly descending into the water. Moments before the passengers contact the water, the vessel operator accelerates to increase lift and the parasail passengers legs "dip" into the water. At Approximately 1554, Captain [REDACTED] dipped the parasail riders the second time. After the second dip, Captain [REDACTED] began reeling the parasail riders into the WHY KNOT.



Photo taken of [REDACTED] and [REDACTED] taken from WHY KNOT at 1554

33. At 1555, weather radar images obtained from WJHG News Panama City clearly show the “Outflow Boundary” in the immediate vicinity of the WHY KNOT. An outflow boundary, also known as a gust front, is a storm-scale boundary separating thunderstorm-cooled air (outflow) from the surrounding air. This results in a direction shift of the wind, decrease in ambient temperature, and an increase of barometric pressure.



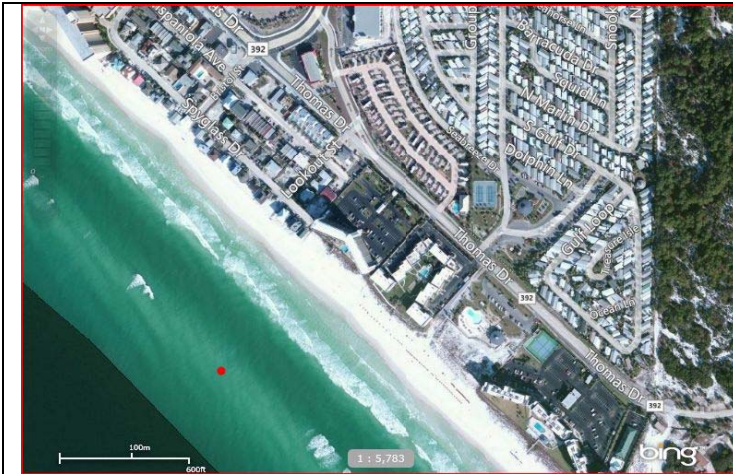
34. At approximately 1555, crewmember [REDACTED] took a picture that shows [REDACTED] and [REDACTED] directly overhead the WHY KNOT.



Photo of [REDACTED] and [REDACTED] directly overhead of WHY KNOT

34. At approximately 1555, immediately after taking the photo showing the parasail directly overhead, the prevailing weather conditions overcame the winch’s ability to reel in the parasail. The WHY KNOT subsequently lost all forward momentum and the combination of the increased strain on the parasail due to the increased wind pulled WHY KNOT stern first toward the beach.

35. As the WHY KNOT began to cross the outer sandbar (approximately 900-1200 feet from the beach), Captain [REDACTED] directed crewmember [REDACTED] to go forward on the vessel and toss the anchor off the vessel's bow to arrest the momentum toward the beach. Once the anchor set, Captain [REDACTED] continued to increase RPM's on the engine to try to get more power to the winch to reel in the passengers for several minutes.



Location of parasail vessel anchored on sandbar  
Approximately 1.25 miles West of St Andrews Pass,  
Panama City Beach, Florida.



External force applied to WHY  
KNOT bent the anchor's shank  
and right fluk

36. At approximately 1559, the towline parted in way of the bowline knot connecting the towline to the parasail.

37. Once the line parted, the wind carried the parasail toward the shore and over the beach. [REDACTED] and [REDACTED] remained strapped into the parasail harness. They collided with the top 12<sup>th</sup> floor balcony of the Commodore Condominiums. The wind carried the parasail and both passengers over the building and across the parking lot toward Thomas Drive. The shrouds of the parasail, with the parasail above and the passengers below, struck power lines and arced, causing a power outage in the immediate area. The wind carried the parasail and the passengers back into the parking lot, crash landing them into parked vehicle.





██████████ and ██████████ just prior to hitting the Commodore Condominiums

Commodore Condominiums, South side. Arrow points to area where passengers made first contact with the 12<sup>th</sup> floor balcony rail.



Balcony damage to top floor, east end condominium

North side parking lot, power lines seen along the road



North side parking lot where parasail and passengers landed

Automobile where ██████████ and ██████████ landed



38. At approximately 1600, Bay County Fire Services were in the area on another call and witnessed the accident from down the street. They arrived on scene within two minutes. They found one of the girls unconscious and completely unresponsive to verbal commands. They found the other girl moving, but unresponsive to verbal commands. They stabilized both girls and arranged transportation to Bay Medical Center in Panama City, Florida.

39. At approximately 1620, Coast Guard and Florida Wildlife Commission (FWC) arrived and began concurrent investigations. Investigators took pictures and talked to eyewitnesses. At the request of Coast Guard investigator, FWC conducted alcohol testing on Captain [REDACTED] and crewmember [REDACTED], with negative results for alcohol. After interviewing Captain [REDACTED] and crewmember [REDACTED], FWC seized evidence, including the WHY KNOT and all of its parasail equipment.

40. On 01 JUL 2013, Captain [REDACTED] completed a Report of Marine Accident, Injury, or Death (CG-2692) for Coast Guard investigators.







41. On 02 JUL 2013, Captain [REDACTED] and crewmember [REDACTED] completed required post-casualty drug testing with negative results for both parties.

42. Both [REDACTED] and [REDACTED] sustained substantial injuries from the casualty. [REDACTED] suffered head and face trauma, right eye displaced, broken vertebrae in cervical neck area, fractured leg, and multiple lacerations to head, face and body. [REDACTED] suffered head and face trauma, broken vertebrae in lumbar area of the spine, and multiple lacerations and contusions to the body. After two weeks, [REDACTED] and [REDACTED] transferred to hospitals closer to their homes in Indianapolis, Indiana for long-term rehabilitation.

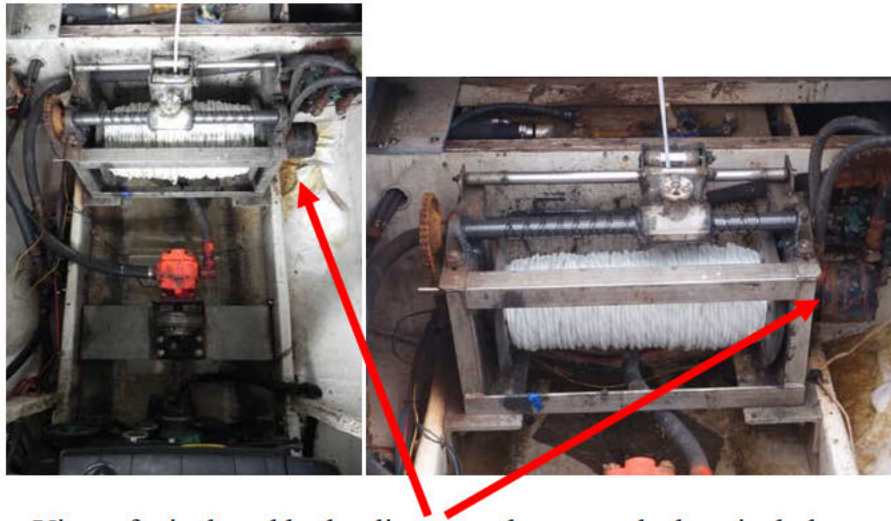
43. Beginning on 02 JUL 2013, Coast Guard, Florida Fish and Wildlife Commission (FWC) and National Transportation Safety Board (NTSB) investigators began their concurrent investigation to determine the causal factors of the marine casualty. The investigation included testing of all mechanical equipment on the WHY KNOT; interviews with numerous eyewitnesses; and interviews of the passengers and crewmembers onboard the WHY KNOT.

**Analysis:**

1. *Parasail Equipment:* Inspection of the parasail and the parasail harness apparatus revealed that all the equipment was in suitable condition for the intended service. The 39-foot Custom Water Sports parasail and the parasail harness showed no rips, tears, fayed shroud lines, or ruptured seams with all webbing and stitching appearing in excellent condition.

	
<p>Parasail</p>	<p>Crown of parasail</p>
	
<p>Parasail Yoke</p>	<p>Upper parasail apparatus</p>
	
<p>Parasail Harness</p>	<p>Parasail Harness Clips</p>

2. *Towline Winch:* On 12 JUL 2013, Coast Guard and FWC investigators, with the assistance of the NTSB investigator, examined the WHY KNOT's towline winch. While investigators observed the winch was functional, they also noted some minor discrepancies or poor mechanical conditions, including a restricted cooling water intake for the heat exchanger, and leaking hydraulic valve used to provide directional control (to pay in or to retrieve), which requiring the crew to place sorbent pads under the system. Despite these findings, supported by the winch operational testing discussed below, the investigators concluded these discrepancies did not reduce the functionality or power of the winch. Further, the investigators noted that the winch was custom built and did not have an associated technical document or manual depicting its specifications, performance parameters, or rated capacities, nor is one required by regulations.



View of winch and hydraulic motor that controls the winch drum from the main deck, looking down toward the front of the vessel. Notice the sorbent pads under the winch system saturated with hydraulic oil.

On 12 JUL 2013, Coast Guard and FWC investigators, with the assistance of the NTSB investigator, conducted a static winch test to determine the force in pounds required to cause winch failure on the WHY KNOT. Test results show a maximum tension of force required to reach a point where the winch would no longer reel in the towline was 1,350 pounds, or an average of 1,280 across all RPMs.



Static Pull test on the towline and winch of WHY KNOT

Static Winch Testing on the UPV *Why Knot*  
US Coast Guard Small Boat Station Dock, Panama City Beach, Florida on July 12, 2013

RPMs Static	
Motor RPMs	Maximum Tension Recorded in Pound Force (lbf)
600	1350
600	1310
600	1270
<b>Average of 3 pulls at 600 RPMs</b>	<b>1310</b>
1000	1260
1000	1300
1000	1310
<b>Average of 3 pulls at 1000 RPMs</b>	<b>1290</b>
1500	1230
1500	1260
1500	1230
<b>Average of 3 pulls at 1500 RPMs</b>	<b>1240</b>
<b>Overall Average</b>	<b>1280</b>

RPMs Variable Ranging between 600 and 2000	
Motor RPM's	Maximum Tension Recorded in Pound Force (lbf)
600 ~ 2000	1220
<b>Lbf varied within 30 lbf as RPMs increased and decreased, but never exceeded peak force noted</b>	

RPMs Increasing from 600 to 1000 ~ 1020	
Motor RPM's	Maximum Tension Recorded in Pound Force (lbf)
600 - 1000	1200
600 - 1000	1230
600 - 1020	1160
<b>Overall Average</b>	<b>1197</b>

Static Pull Test Results

The empirical data shows that as engine RPMs increased, maximum winch tension decreased. While it may appear counterintuitive, this inverse relationship between RPM and tension agrees with established mechanical engineering theory regarding power, or torque in rotational systems.

Torque is defined as the force that gives rise, and is the result of, rotational motion. Torque in a rotational system is analogous to force in a translational system, replacing the straight-line distance of the translational system with an angular quantity. Mechanical engineers use torque to describe forces and motion acting on shafts and other power-transmitting machines, such as gearboxes and winch systems.

Derived from Newton's Second Law, Force = Mass x Acceleration, Power as it relates to torque involves the equation of Work (Force x Distance), and the equation for Power (Work/Time). In the equation used to calculate torque,  $T = f (r \sin \theta)$ , torque (t) is equal to force (f) times the radius (r) through which it acts and the angle ( $\theta$ ) at which the force is applied. The equation:  $HP = (t \times rpm) / 5,250$  defines horsepower, and solving for torque one gets  $t = (HP \times 5,250) / rpm$ . The web page <http://www.pump-zone.com/topics/motors/ac-motor-torque> offers further details.

In this marine casualty, as Captain [REDACTED] increased RPMs to the engine, thinking it would increase the winch tension, it actually accomplished the opposite, – it decreased tension. He was in fact getting less pounds of force from the winch as he applied more RPMs.

To examine the “typical” forces applied to the towline and winch in favorable weather conditions, on 13 JUL 2013, investigators also conducted underway test of force applied to the towline utilizing the WHY KNOT and the parasail involved in the casualty. Comparing the results of this underway operational test to the results of the maximum static pull test, results clearly indicate the winch experienced only half the tensional or torque forces compared to the static pull testing. Therefore, the operational and wind conditions at the time of the marine casualty presented forces almost double the “typical” parasail operations in favorable conditions.



Underway testing of force applied to towline of WHY KNOT

Underway Testing of Force Applied to the Towline of the UPV *Why Knot*  
West Bay Basin, Panama City Beach, Florida on July 12, 2013

Rescue Mannequin with weight of 50 pounds in Flight Wind Speeds 2 to 4 MPH		
Motor RPM's	Speed Over Ground (SOG)	Tension Recorded in Pound Force (lbf)
1200	6.2	210 ~ 290
1200	6.6	220 ~ 310
1530	Not accurately recorded	250 ~ 490
1790	Not accurately recorded	370 ~ 390
2000	Not accurately recorded	400 ~ 620
Overall Average of Peak Force		420

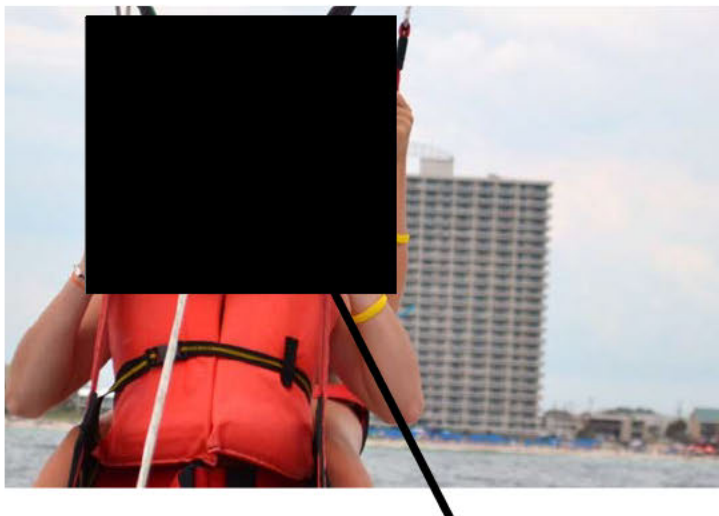
Tandem Flyers (Employees of Aquatic Adventures) with combined weight of 385 pounds in Flight Wind Speeds 2 to 4 MPH		
Motor RPM's	Speed Over Ground (SOG)	Tension Recorded in Pound Force (lbf)
2480	16	460 ~ 620
2480	17	460 ~ 630
2530	16	460 ~ 750
Overall Average of Peak Force		667

Underway testing of force applied to towline of WHY KNOT

During discussions with industry representatives, Marine Casualty Investigators learned that during the past several years the parasail industry has seen advances in safety equipment and parasail design. In particular, manufacturers introduced larger parasail canopies, such as 39-42 foot sizes, and are quickly becoming the most popular sizes sold. This is due to their ability to carry more weight in lighter wind conditions. In addition, manufacturers are constructing newer parasail boats with different winch systems designed to utilize these larger parasail canopies. Currently, manufacturers of parasail winch systems and/or parasail vessels do not document, recommend, or restrict the size of parasail and lines suitable for that winch system. This issue of selecting the proper winch system to match the type of parasail equipment presents a viable topic to include in any parasail equipment standards under future development.

During the time of the WHY KNOT's construction in 1998, the vessel originally installed and used a smaller sized parasail. As was standard industry practice at that time, operators used the smaller canopies as they carried less weight and provided less wind resistance. Further, manufacturer installed the vessel with a winch that did not include a hydraulic break, a feature newer winch systems now include. In this marine casualty, because of the prevailing lighter winds conditions at the start of the parasail rides, the WHY KNOT's Master, Captain [REDACTED], utilized a 39-foot parasail canopy. This 39-foot parasail is larger than the parasails in existence at the time of the winch's installation. Coupled with the increase in wind conditions, the forces applied to the larger canopy exceeded the capabilities of the installed winch system.

3. *Parasail Towline and Knot:* When [REDACTED] tied the rope to the parasail harness with a bowline knot (the standard knot used by parasail and mariners); there was a piece of black tape on the end of the rope, just above the bowline knot. When investigators examined the rope after the casualty, there was no tape on the end of the towline. The lack of tape on the end of the line indicated to investigators that the line parted under strain and caused the line to split into two separate pieces at the knot. The NTSB report discussed below confirmed this assessment.



Line end has black tape on it at the beginning of the parasail flight



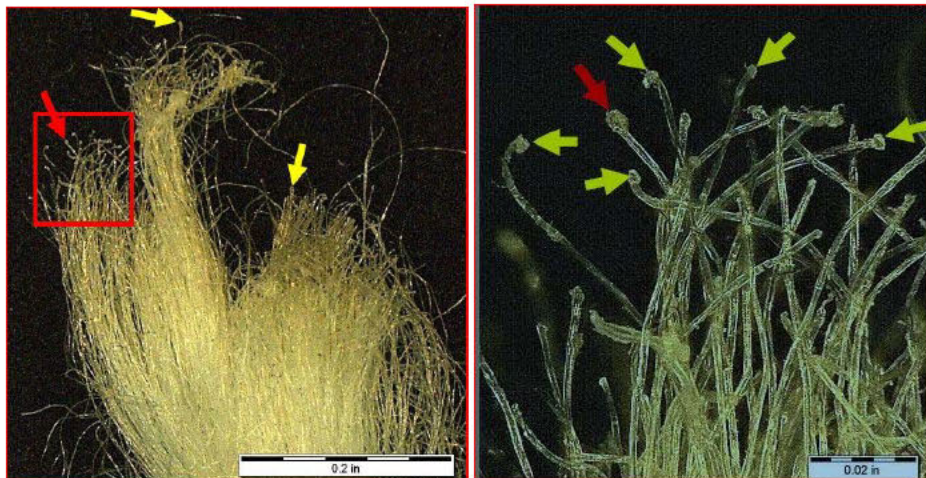
Line end still attached to the roll of line on the drum onboard the WHY KNOT

Investigators contracted Southwest Ocean Services to conduct strength test of the rest of the towline against exemplar samples of a new towline from the manufacturer. On 13 AUG 2013, investigators received a report from Southwest Ocean Services outlining the towline breaking strength compared to an identical exemplar samples. Test certificates show:

- Cordage Institute listed breaking strength – 4,295 pounds
- Average for new exemplar sample from manufacturer – 4,316 pounds
- Average for towline from WHY KNOT – 3,858 pounds (90% of advertised breaking strength)
- Average for towline from WHY KNOT with bowline knot – 2,642 pounds (62% of advertised breaking strength). Each rope parted at the tied bowline knot.

Based on the above information, it appears that overall the towline was in suitable condition. The statistical difference between the averages for the exemplar sample and the towline used during the casualty was about 10%. The towline on the WHY KNOT still demonstrated 90% of its advertised breaking strength without the knot, and about 60% with a knot. .

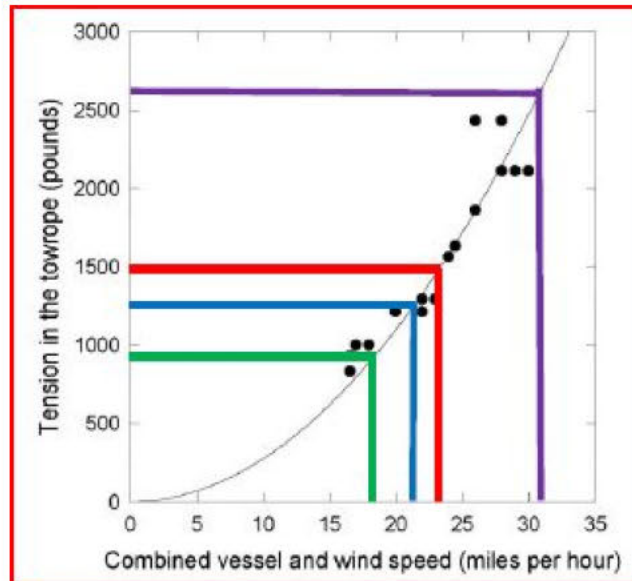
On 22 NOV 2013, Coast Guard investigators received NTSB report 13-064 providing their analysis of the end of the towline (section that parted). The NTSB visually examined the end of the parasail towline using low and high magnification levels, stating, “The test revealed raveling of the filaments adjacent to the tips and globules at the tips, consistent with a relatively high speed loading rate. Under such conditions, the loading of the filaments produces heat, which softens the filament and causes its fracture. The resulting snap-back from the release of stored energy causes the material to collapse to form the globules and the raveling.”



Low-level magnification of parted towline end    High-level magnification of parted towline end

NTSB's report also addressed the combined vessel and wind speed/tension in towline correlation, stating: "The knotted towline sample failed at 2,642 pounds of tension, 1,633 pounds below the specified strength (a reduction in strength of 38%)."

NTSB's report presented a graph depicting combined Bessel and wind speed to towrope tension. In refereeing to this graph, the report stated: "a tensile load of 2,642 pounds in the towline, represented by the purple line, would be consistent with a wind speed, or a combined vessel and wind speed, in the vicinity of 31 mps".


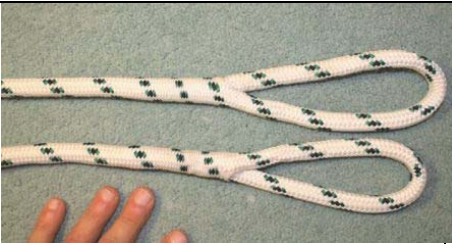



Graph from NTSB report 13-064 showing the combined wind speed/tension correlation

Towline/Breaking Strength/Winch correlation: After conducting the above tests to document the towline's breaking strength, maximum tension of the winch, and the actual breaking point of the line, Coast Guard investigators surmised the following: The towline with a bowline knot failed at approximately 2,642 pounds of force, about twice as the winch's average maximum tension of 1,350 pounds of force. The combination of high wind speeds (approximately 31 mph) and a larger parasail canopy size created forces too large for the tow winch to retrieve, eventually causing the towline to part at its maximum breaking strength with a bowline knot (1,633 pounds below the specified strength (a reduction in strength of 38%)).

Considering the use of a bowline knot decreased the strength of the line by almost 40%, it stands to reason it would be prudent for operators to use other effective methods to attach the parasail towline. Significant gains in towline strength and reliability is achievable by use of chaffing devices (metal hardware or thimble in the formed eye of the line), and more effective knots, such as a double figure eight knot or splices. While these knots require operators to use greater care and attention to apply, they maintain greater line strength over a typical bowline knot. Maintaining this strength may have given the parasail operator more time to ride out the storm until the winds passed and thus may have been afforded the opportunity to safely recover the aloft riders before the line parted.



 <p>Standard Bowline Knot</p>		
Standard bowline knot	Double braid line splice	Double figure eight knot

4. *Parasail A-Frame and other equipment.* The WHY KNOT uses an aluminum A-frame system to conduct its parasail operations. The A-frame consists of a pulley that connects the parasail towline from the parasail apparatus through a hole in the deck to the parasail towline drum and winch. When examining the WHY KNOT's A-frame, investigators discovered the pulley's u-bolt nuts were only hand tight and were within a few turns from falling off. The bolts were not fitted with a means to prevent them from backing off, in that they were not fitted with locking washers, a second nut, or of the aviation type nut that provide plastic anti-backing fittings. The investigators surmised that if this condition continued, the pulley would very likely dislodge itself from the A-frame. During their examination of other parasail vessels, they noticed similar findings, particularly in those of the same vessel type and manufacturer, late 1990's Premium parasail vessels.



WHY KNOT's A-Frame. Investigators found the pulley's u-bolt nuts only hand tight and only a few turns from falling off.

Included in the WHY KNOT's parasail equipment was a Chute Wrangler. Manufactured by Custom Chutes, Inc., the Chute Wrangler assists a parasail crew in the recovery of a parasail during times of an emergency, such as when a line breaks and the parasail falls into the water and may potentially drag the parasail riders. Fitted onto the rear riser of parasail, a passenger or crewmember can deploy the Chute Wrangler in the water to help bring a parasail to a slow stop, much like a sea anchor. Each parasail requires its own specific Wrangler deflation line appropriate for the various sizes of parasails. Investigators noticed the crew did not install the Chute Wrangler onto their parasail and found it tucked away in an onboard storage box. The crew indicated they did not use the Chute Wrangler because they did not have the correct size deflation line for their parasail.



WHY KNOT's Chute Wrangler.

Investigators examined the WHY KNOT's onboard portable fire extinguisher. They found the extinguisher was in a non-serviceable condition as the handle used to discharge the extinguishing agent was broken and missing.

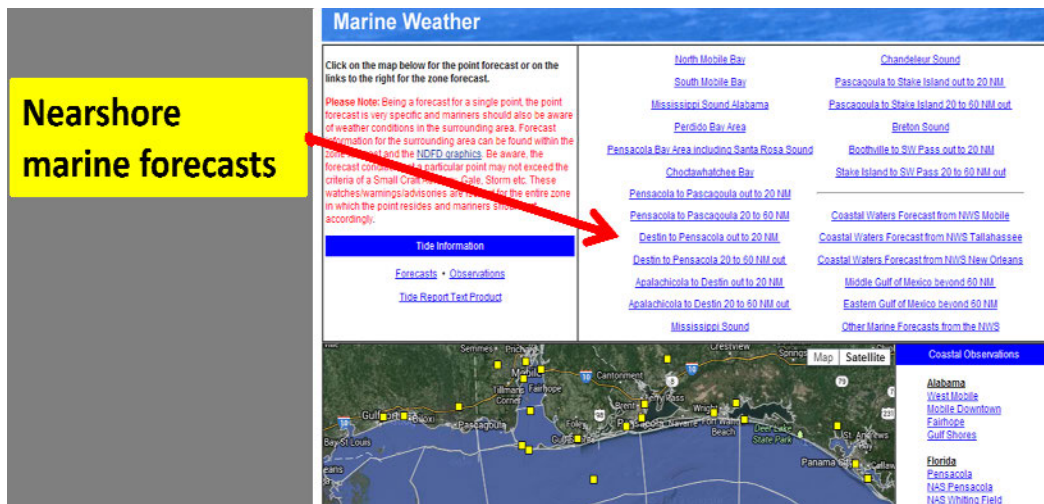


WHY KNOT's onboard portable fire extinguisher.  
Note the operational handle is broken off and missing.

5. *Weather:* All mariners, including parasail operators, can easily access National Weather Service (NWS) Forecasts and receive advisories and warnings from a number of sources. Mariners can view NWS websites (Weather.gov), monitor the NOAA Weather Radio available on many VHF marine band radios, and Smartphones (mobile.weather.gov).



Screenshot of NWS Weather Forecast internet web page. Nearshore forecasts are found on the marine page found on the right.



Aquatic Adventures uses the Water Sports Industry Association (WSIA) Parasail Training Manual dated 2010 as part of its vessel captain training program. The WSIA Parasail Training Manual contains information on parasail equipment and operations, including discussion on maxim wind speed and wave height. Aquatic Adventures Employee Training worksheets reflect key elements of the WSIA Parasail Training Manual, including maintaining a weather log and monitoring weather conditions.

On 01 JUL 2013, the WHY KNOT was equipped with an operational VHF Marine Band Radio capable of receiving special weather broadcasts. The radio was energized and operational. However, Aquatic Adventures employees and parasail vessel operators relied on the use of handheld radio to collaborate on parasail operations and communicate weather conditions. Aquatic Adventures employees selling parasail tickets on the beach, historically and per company policy, access, and interpret radar returns from several weather Internet sites, mostly on cell phones. Those employees, including the company's "safety officer", relay weather information to the masters on the underway vessels.

Captain [REDACTED] stated to investigators that on the day of this marine casualty, he did not check the marine radio for weather updates. However, like other parasail operators, he did log the weather in the "Captain's daily weather log". His "PM" observation indicated: wind speed - 5, current weather - scattered showers, clouds - partly, seas - 1-3.

At approximately 1305, National Weather Service Tallahassee issued a Special Marine Warning for Panama City Beach, FL, out to 20 NM over the Gulf until 1400. The warning indicated a thunderstorm was observed capable of producing winds in excess of 34 mph and a waterspout about 8 NM southwest of Laguna Beach, moving Northeast at 15 mph. The warning advised mariners to expect strong winds, high waves, dangerous lighting and heavy rains and for boaters to seek safe harbor until the storm passed.

At 1340, Captain [REDACTED] terminated parasail operations due to inclement weather, as did other nearby parasail operators. At approximately 1520, Captain [REDACTED], noting "normal wind conditions", resumed parasail operations. Because at this time the winds were light, he installed the larger 39-foot parasail canopy, as its design is suitable for such light conditions, were the small canopy is suitable for stronger wind conditions.

The National Weather Service Radar images from 1402 and throughout the afternoon indicated developing storms over the Gulf, moving northeast toward Panama City Beach. As the intense sections of the storm reached the operational area, winds rapidly increased to 8.9 mph to 14 mph with gusts to 20 mph.

Once the WHY KNOT's Master, Captain [REDACTED], resumed parasail operations, he did not proactively assess weather forecasts, using his VHF Radio, Internet radar imagery or other means. He did not obtain updated weather radar conditions or forecasts. Further, after restarting operations in the afternoon, Aquatic Adventures employees observed the weather to the south of their location. However, they failed to determine the storm's relative motion and growing intensity, monitor the weather in accordance with the WSIA Parasail Training Manual and company training worksheets, and take appropriate action to cease parasail operations.

At the time the WHY KNOT was unable to retrieve the aloft parasail riders, the winds pulled the parasail and boat closer to shore and parted the towline. Radar images at this time show an outflow boundary with winds gusting in excess of 20 mph. These wind speeds exceed the rated capacity of the 39-foot parasail.

6. *Voluntary Parasail Industry Guidelines:* As there are no regulations pertaining to parasail equipment, owners/operators select parasail gear and conduct parasail operations based on industry standards. Owners/operators make the decision on equipment variations, line selection and parasail size, which each have a direct impact to forces applied to the winch system and external forces applied to the vessel. Parasail operations can vary from vessel to vessel, as well as region to region.

Over the past 15 years, various parasail organizations developed parasail operational guidelines and risk assessments, including the Parasail Safety Council, The Professional Association of Parasail Operator's (PAPO) Operating Standards and Guidelines (OSAG), and the Water Sports Industry Association's (WSIA) Parasail Training Manual. These organizations, comprised of parasail operators and industry representatives, develop these guidelines and encourage their members to follow them voluntarily. In some cases, membership or participation to the guidelines may qualify the company for reduced insurance premiums.

The Parasail Safety Council's web page and literature aims to "provide the general public and government entities reliable information about parasailing including safety issues, risk awareness, and standards with a focus on education, certification, and regulation". PAPO's OSAG consists of general rules and regulations, operating conditions, commercial vessels, parasailing equipment, safety equipment requirements, and crew personnel requirements. Similarly, WSIA's Parasail Training Manual contains information on maximum wind speed and wave height, proximity to shore, parasail flight principles, emergency procedures, and captain and crew operational skills.

ASTM International, formerly known as the American Society for Testing and Materials (ASTM), is a globally recognized leader in the development and delivery of international voluntary consensus standards. In May 2011, the Coast Guard approached ASTM and industry groups and proposed the development of a voluntary consensus standard. ASTM held an initial meeting and the industry participants agreed to establish such standards, citing there was a need to do so. ASTM is currently developing voluntary standards regarding parasail equipment, crew requirements, and operation guides.

In April 2013, ASTM finalized ASTM Standard F2993-13 - Standard Guide for Monitoring Weather Conditions for Safe Parasail Operation. This standard currently only advises the operator to monitor current weather conditions. Unlike the WSIA Manual, it does not advise the operator to monitor forecasted or predicted weather conditions of the operational area.

It is worth noting, Aquatic Adventures personnel (the owner and safety officer) actively participated in the development of ASTM Standard F2993-13 - Standard Guide for Monitoring Weather Conditions for Safe Parasail Operation. Further, as discussed in more detail below, Aquatic Adventures also implemented WSIA's Parasail Training Manual to train its parasail operators. In being familiar with existing WSIA guidelines that require operators to monitor forecasted weather conditions, it is interesting to note why this critical factor regarding weather forecasting was not included in the ASTM standards, the development of which included Aquatic Adventures participation.

7. *Master's Lack of Adherence to Parasail Industry Recommended Practices.* While Aquatic Adventures, the owner of the WHY KNOT, is not a member of any parasail organization, it did take some voluntary steps to implement established recommended practices for parasail operations and crew training. Aquatic Adventures utilized the WSIA Parasail Training Manual to train its parasail operators, and required all masters to sign each page of the Manual and Aquatic Adventures Employee Training worksheet. The Aquatic Adventures Employee Training worksheet reflects key elements of the WSIA Parasail Training Manual, including weather log and monitoring standards.

On 17 APR 2013, Captain [REDACTED] completed company training utilizing the WSIA Parasail Training Manual and signed the Aquatic Adventures Employee Training worksheet. This indicates Captain [REDACTED] was familiar with and aware of established WSIA procedures and company expectations for conducting parasail operations.

In this marine casualty, Captain [REDACTED] failed to comply with several sections of the WSIA Parasail Training Manual, the Aquatic Adventures Employee Training worksheet, which he signed attesting his knowledge of its contents, as well as certain aspects of the Standard Guide for Monitoring Weather Conditions. Specifically:

a. Flight zone safety (forecast of wind speed, weather, and sea conditions) / Weather Log & Monitoring Weather Conditions. The WSIA parasail Training Manual requires the parasail operator to have good knowledge of the local area's weather and gather as much information as possible about the flight zone conditions to operate safely. Before operating, the Captain should collect as much weather reports and information from television, marine radio, and internet websites. Further, the Captain should log these forecasts before operating, and maintain a visual inspection of the flight zone's weather features and look for indications of changes or pending adverse weather. The Employee Training Worksheet requires the Captain to have access to an hourly weather report while operating the vessel, access to radar monitoring device and local weather stations, as well as knowledge of typical weather and signs in changing weather.

While Captain [REDACTED] logged his weather observations, he failed to access available weather forecast reports, make a proper assessment of how the forecasted weather would affect the operational area, maintain accurate visual inspection of the flight zone's weather features, and failed to detect and react to changes or pending adverse weather.

Further, as discussed above, the ASTM Standard only requires the operator to monitor and log the current weather conditions before initiating parasail operations. Unlike the WSIA Manual, it does not specifically require the operator to monitor forecasted or predicted weather conditions of the operational area, i.e. to assess if parasail operations should continue. In this case, while the Captain did maintain a weather log, he failed to continuously monitor the operational weather conditions to avoid conducting parasail operations in weather conditions that exceed the manufacturer's specified limitations of the equipment.

b. Proximity to shore. The WSIA Parasail Training Manual indicates the parasail vessel should operate a certain distance from shore, given various wind speed and towline lengths, to provide enough sea room and time to react and take corrective action in case of an emergency situation – such as when the operator is unable to retrieve the aloft parasail riders. For winds of 0-10 mph, parasail vessels should stay a minimum of 2,000 ft from shore when using 500 - 1,000 ft of towline. For winds of 20-25 mph, the minimum distance from shore is 5,000 ft when using 500 – 1,000 ft of towline.

Captain [REDACTED] failed to follow this proximity to shore guideline. During the first leg of the operation, he operated the WHY KNOT 1500 – 2000 feet offshore in a westerly course. He turned the vessel and proceeded east on the second leg of the operation. Once the high wind caught the parasail, the external forces quickly reached a point where the winch could no longer reel in the parasail and passengers, leading the towline to part.

To combat the external forces, he should have maneuvered the vessel on a northeasterly course (towards shore and with the wind) to release wind pressure on the canopy and winch. However, since the vessel was operating very close to the sand bars off the beach (900-1200 feet), there was no sea room to conduct this kind of operation. Had he operated the vessel further offshore, he would have had more sea room and time to take this corrective action. He subsequently anchored the vessel to avoid running the vessel aground in the shallow waters of the sand bar.

c. Parasail Canopies/Parasailing Equipment. The WSIA Parasail Training Manual states “The correct size parasail can be determined for conditions and environment by looking at locations, wind speed, sea conditions and surrounding land mass; common passenger types (if flying singles, doubles or triples). Commonly you would have three parasail sizes on a parasailing vessel, one for local low wind, one for local medium to high wind and one for local high wind. Contact your parasail supplier for the recommended maximum wind speed and maximum and minimum weight restrictions for all the parasails. WSIA recommends that you do not exceed the manufacturers’ recommendations.”

Captain [REDACTED] failed to follow these equipment selection guidelines. In noting the light winds during the initial part of the parasail operation, he selected to use the larger Custom Chutes 39-foot parasail, one designed to operate in lighter wind conditions. The manufacturer’s label affixed to the parasail clearly identified its operational limitations. The label states the canopy operational design is for a passenger weight load between 150 and 560 pounds and in winds no greater than 12 mph with air management zippers closed and 14 mph with air management zippers open.

In operating in wind conditions that eventually exceeded 20 mps and approached over 30 mph, Captain [REDACTED] operated in wind conditions that far exceeded the parasail’s rated and labeled capacity. In addition, the towline failed at almost twice the rated capacity of the tow winch’s ability to reel in the towline. The combination of high wind speeds (approximately 31 mph) and a larger parasail canopy size created forces too large for the tow winch to retrieve, eventually causing the towline to part at its maximum breaking strength.

8. *Knowledge based Planning Error – Failure to plan and monitor predicted weather conditions.* Information gathered by investigators show the prevailing weather conditions greatly contributed to this casualty. Although afternoon thunderstorms are typical off the coast of Panama City Beach, Florida in the Gulf of Mexico, Captain [REDACTED] did not fully ascertain the severity of the storms on 01 JUL 2013. National Weather Service reports list severe thunderstorms in the area earlier in the day capable of producing strong winds, high waves, and dangerous lighting. While the initial weather warning was valid until 1400, there were still storm cells offshore in the Gulf of Mexico visible on the beach 1530 as passengers began loading onto the vessel. Evidence and information gathered from witnesses to this marine casualty show that a storm front came through the area while the WHY KNOT had passengers flying.

As such, the captain, [REDACTED] failed to recognize changing weather conditions and failed to ascertain the risks of the approaching severe weather system while underway. He failed to consult all available weather data, including NOAA weather radar data available on the web clearly indicating a moving storm front coming into his operational area. Aquatic Adventures employees also failed to monitor all available weather data and pass that information to Captain [REDACTED]. In addition, because crewmember [REDACTED] was also taking pictures of the parasail riders for purchase (Aquatic Adventures does not allow passengers to bring along their own cameras), he failed to focus on his responsibilities to assist the Master in monitoring the weather and acting as a lookout for other vessels. In these failures, the captain and the company committed a ‘Biased Planning Error’ – the tendency to apply a certain action regardless of the situation. In this case, the weather conditions appeared typical for the operational area.

While Captain [REDACTED] did not violate any formal federal regulations, he did violate established industry and company’s guidelines. Given the prevailing and predicted weather conditions, it would have been prudent for him to cease parasail operations, as other operators in the area had done. Likewise, Aquatic Adventures failed to exercise adequate oversight of prevailing weather conditions and require its operators to cease parasail operations.

9. *Coast Guard Parasail Policy and Outreach Programs:*

a. *Passenger Vessel Standards.* Commercial parasail vessels can fall under one of two categories, inspected or uninspected. The Coast Guard inspects commercial passenger vessels carrying six or more passengers for hire under 46 CFR Subchapter T – Small Passenger Vessels. The Coast Guard issues inspected vessels a Certificate of Inspection, and inspect the vessel for compliance at least once a year during annual exams. Regardless whether a vessel is inspected or uninspected, the Coast Guard does not have regulations to govern equipment inspection, operation of associated parasailing equipment or operations. Nor are there regulations governing allowable weather conditions for commercial parasail operations, or for parasail operators to monitor the prevailing and forecasted weather conditions. However, per 46 CFR 185.304, operators of inspected vessels are required to operate the vessel in a manner that keeps the safety of the passengers and crew foremost in mind by directing the vessel in order to prevent a casualty. There, operators must pay special attention to the prevailing and forecasted visibility and environmental conditions, including wind and waves.



b. *Licensing.* Title 46 U.S. Code (USC) Part E – Merchant Seaman Licenses, Certificates, and Documents, establishes the authority for the Coast Guard to issue, suspend, and revoke merchant mariner credentials for individuals engaged on U.S. vessels.

Title 46 USC 7101 – Issuing and classifying licenses, authorizes the Secretary to issue licenses:

- based on tonnage, means of propulsion, horsepower, vessel operating area, and other reasonable standards. Subsection (b).
- to certain classes of applicants, including masters, mates, engineers, pilots, and operators, when found qualified as to age, character, habits of life, experience, professional qualifications, and physical fitness. These qualifying standards must be necessary, reasonable, and related to the rigors of the profession. Subsection (c)
- based on suitable career patterns and service and other qualifying requirements appropriate to the particular service or industry in which the individuals are engaged. Subsection (d).

Currently, the Coast Guard’s Merchant Mariner credentialing program does not require specific licensing requirements or endorsements for parasail operations. As discussed below, in the absence of a regulatory regime and its enforceable standards, the responsibility to manage parasailing risks falls primarily with the parasailing company and specifically on the parasail operator. Yet, for Coast Guard licensed parasail operators, whom are subject to Coast Guard expectations to follow voluntary standards, failure of which can result in enforcement actions, the Coast Guard does not require demonstration on the ability to conduct parasail operations, a particular service or industry segment not otherwise captured in standard and current licensing requirements.

Because parasail safety is very much dependent on the performance, judgment, and skills of the parasail operator, Coast Guard initiatives to require parasail operators of both inspected and un-inspected vessels to hold a parasailing endorsement would make great strides in preventing future parasailing accidents. By its nature, parasailing requires vessel operators to perform tasks beyond what is normally required to navigate safely a traditional passenger vessel. The Coast Guard, in considering parasail operations as “other reasonable standards” and of a “particular service or industry” can implement improvements to its Merchant Mariner licensing program afforded to them in 46 USC 7101 and address known or latent unsafe conditions before actual harm occurs. Just as the Coast Guard issues other existing endorsements, such as assistance towing, this parasail endorsement would provide a comprehensive and adequate means of determining and verifying professional qualifications to serve on a merchant vessel, including small passenger vessels that carry passengers. Parasail endorsements would also install required actions on parasail operators, other than reliance on their ability to implement voluntarily to unenforceable industry standards.

c. *Current Policy.* As discussed in reference (c), presently, the Coast Guard lacks regulatory authority to compel compliance with regard to parasailing operations or equipment, adding:

“Current marine inspection law would only permit promulgating such regulations for Coast Guard inspected small passenger vessels. New legislation would be required prior to promulgating any regulation pertaining to parasailing operations for uninspected passenger vessels, which comprise the majority of all parasailing vessels. While the Coast Guard does not intend to seek the legislative and regulatory authority to establish a distinct license to operate commercial parasailing vessels, the Coast Guard feels establishing minimum training and experience standards, in collaboration with parasailing or consensus standard organizations, for operators and crew of parasailing vessels would increase parasailing safety. In addition, Coast Guard Headquarters plans to establish an internal working group to explore legislative, regulatory, and policy options.”

d. *Education and Outreach.* Current Coast Guard initiative to promote parasail safety focuses on outreach and education, which involves the publication of various safety alerts, press releases, and voluntary dockside discussions with parasail operators. These discussions aim to promote parasail best practices. The Coast Guard’s pamphlet using the mnemonic “Know your ROPES”, briefly summarized below, reminds parasail operators of important safety issues that may prevent future casualties.

“Know your ROPES” stands for:

- R is for Remember: most parasail fatalities and injuries occur from towline failures.
- O is for Observe and Monitor weather conditions continuously: ASTM Standard F2993-13 “Standard Guide for Monitoring Weather Conditions for Safe Parasail Operation.”
- P is for Prepare for emergencies: have well-documented procedures and conduct crew training to ensure proficiency in responding to various types of emergencies.
- E is for Ensure you properly maintain all of your parasail equipment on a continual basis.
- S is for Safety: Safety is up to the parasail operator. The Coast Guard ensures safe operation of vessels, but does not regulate parasail operations or inspect parasail equipment.

On 15 SEP 2009, the Coast Guard published Marine Safety Alert 06-09 – Parasailing Incidents. In this Safety Alert, the Coast Guard reminded the parasailing industry, its vessel owners, operators, and shore side personnel “to be vigilant in their observations of current and forecasted weather and sea conditions with particular attention paid to wind speed. Approaching weather patterns or squall lines present significant hazards to these operations due to sudden and dramatic shifts in wind direction, gusty winds, or even lightning. In a matter of a few short moments what is intended to be a pleasurable experience can become life threatening.”

On 20 SEP 2011, the Coast Guard published Marine Safety Alert 05-11 – Parasailing Operations. This Safety Alert again reminded parasail operators to implement parasail best practices, as discussed in the mnemonic “Know your ROPES.”

In response to this marine casualty, the Coast Guard published Marine Safety Alert 07-13 – Parasailing. As with Safety Alert 05-11, this Safety Alert also reminded parasail operators to implement the mnemonic “Know your ROPES”, adding it reminds parasail operators of important safety issues that may help prevent future casualties. It also indicated “A series of parasail incidents resulting in fatalities and injuries have occurred over the last few years. Since 2006, there have been 11 deaths and 52 injuries because of parasailing activities. There have been several common factors in all of these incidents that are unique to parasailing” and “The Coast Guard encourages owners and operators to work with each other and related industry associations to share best practices and develop operational standards to maximize safety and prevent marine casualties. *Enforcement action may be taken against the operator for misconduct or negligent operation.*”

e. *Enforcement.* Apart from education and outreach efforts, the Coast Guard promotes parasail safety through enforcement action against negligent Coast Guard licensed parasail operators. In a press release published on 05 AUG 2013 by Coast Guard Headquarters:

“The Coast Guard expects licensed mariners to follow all regulations regarding safe vessel operations and has an expectation of parasail operators to follow established standards. Parasail operators must evaluate and consider all safety risks before getting underway, including weather conditions and maintenance of equipment, in order to ensure safe parasailing activities. In the future, we expect the parasailing industry and related industry associations to share best practices and develop operational standards to maximize safety and prevent marine casualties. Additionally, the Coast Guard asks those who decide to engage in this activity to consider the risks and to understand current safety standards for parasailing. Parasailing equipment is not regulated or inspected by the federal government.”

The lack of enforceable standards specific to parasailing does not prohibit the Coast Guard from taking measures that serve as a deterrent and reduce the frequency of similar casualties. These measures include taking action against the credentials held by an operator of an inspected or uninspected vessel for misconduct or negligence. 46 CFR Part 5. In 33 CFR 1.07, the Coast Guard may also pursue civil or criminal penalties for negligent operations.

The underlying principle of these enforcement measures is that the threat of punishment influences individual behavior of the licensed operator, to the extent that safety gains a higher priority. Although these measures may serve as a deterrent and serve its purpose to help prevent reoccurrence, they do not address known or latent unsafe conditions before actual harm occurs, nor do they systematically reduce competitive advantages enjoyed by those companies that under invest in areas related to parasail safety. Further, compliance is dependent solely on the operator, not on the operating company, whom has a significant oversight and control to promote parasail safety within its organization.

f. *Federal Regulations and Regulated Navigation Areas (RNA)*. The Coast Guard encourages the development of industry consensus standards for parasail operations, such as the current efforts of ASTM International. Such voluntary standards will provide the industry an opportunity to improve parasail safety without additional Federal Regulation. Indeed, the Coast Guard should provide the parasail industry an opportunity for implementation and evaluation.

If future analysis and evaluation of industry consensus standards show the standards fail to address latent unsafe conditions, parasail casualties continue to occur, and operators continue to fail to follow voluntary standards, as was the case in this marine casualty, the Coast Guard may consider establishing specific legislation and regulations on parasail equipment, operations, and licensing requirements. The Coast Guard may also consider establishing RNAs, as provided in 33 CFR Part 165, to apply certain regulations to restrict vessel operations to vessels that have particular operating characteristics or capabilities.

### **Conclusions:**

1. In accordance with Marine Safety Manual, Volume V, the initiating event, (or first unwanted outcome) for this casualty was the failure of the winch to retrieve the aloft parasail passengers during the passing storm front and associated high winds.
2. The causal factors that led to the casualty are as follows:
  - a. Environment: The prevailing weather conditions had a substantial role in this casualty. Weather conditions at the time of the casualty far exceeded the equipment limitations.
  - b. Personnel: human error on the part of vessel's Master and the operating company.
    - i. Employees of Aquatic Adventures failed to evaluate and determine if the prevailing and forecasted weather conditions were conducive for parasailing operations.
    - ii. While underway with passengers, Captain [REDACTED] failed to monitor and recognize the approaching severe weather system and take precautionary measures.
    - iii. Captain [REDACTED] failed to follow established industry recommendations regarding weather and proximity to shore. He allowed himself to face a high wind situation, leaving little room to maneuver to reduce wind forces on the parasail.

c. Equipment:

- i. High wind conditions generated sufficient force to prevent the towline winch from retrieving the parasail and the aloft passengers.
- ii. Once the deployed anchor set and held the vessel in one location, the additional force added to the stress on the parasail towline, causing it to exceed its breaking strength.
- iii. The resulting load on the parasail towline caused the line to part at or near the bowline knot securing the towline to the parasail harness yoke.
- iv. Captain ██████████ operated the Custom Chute 39-foot parasail in winds exceeding the manufacturer's 12 mph maximum wind speed.
- v. The towline winch, while originally designed for smaller chutes, is less capable to handle larger 39-foot chutes. Utilization of the larger chute, coupled with operations in stronger winds, placed a greater demand on the winch system's design limits, resulting in the inability of the winch to retrieve the parasail safely onboard.
- vi. The use of a bowline knot and the absence of chaffing devices at the eye of the line, weakened the strength of the parasail towline by about 40%, causing the line to part

d. Industry Standards/Safety Regulations:

- i. There are no federal regulations on parasail operations or equipment. Without such regulations, parasail safety is dependent on the industry's willingness and ability to implement voluntary industry standards. Compliance is solely dependent on enforcement measures against negligent operators, not the operating company. Although enforcement measures may serve as a deterrent, they do not address known or latent unsafe conditions, nor do they systematically promote parasail safety across the organizational system, thus failing to promote reoccurrence.
- ii. There are no regulations requiring Coast Guard licensed operators to demonstrate competency to address the dynamic and uniqueness of parasailing operations.
- iii. Industry consensus standards, either existing or currently under development, remain voluntary and have little to no means to detect or compel compliance.

3. Other than stated above, there is no evidence that the condition of the vessel itself contributed to this casualty.

**Recommendations:**

*Safety:*

1. It is recommended that the Commandant of the Coast Guard, in consultation with national parasailing organizations and/or parasailing industry, use its discretion afforded in 46 USC 7101 to develop a distinct parasail endorsement and require parasail operators that operate either inspected or un-inspected parasail vessels, to hold such an endorsement when conducting parasail operations. In light of the Coast Guard's efforts to encourage the development of industry consensus standards for parasail operations, such as the current efforts of ASTM International, Commandant should consider and gage the success of the industry's efforts to improve parasail safety without additional Federal Regulation. If future analysis and evaluation of industry consensus standards show the standards fail to address latent unsafe conditions, parasail casualties continue, and operators fail to follow voluntary standards, as was the case in this marine casualty, the Coast Guard may consider establishing licensing requirements that require parasail operators to demonstrate their ability to conduct proper parasail operations.
2. It is recommended that the Commandant of the Coast Guard research and consider developing regulations regarding parasail operations or inspect parasail equipment on all parasail vessels that carry at least one passenger for hire. Understanding that the Coast Guard would have to seek legislative and regulatory authority such action for uninspected passenger vessels, and ASTM is currently developing consensus standards for the parasail industry; Commandant should consider the rate of casualties occurring on parasail vessels as compared to other commercial operations, and consider the effectiveness of industries' implementation of ASTM's parasail standards. If Commandant were to develop such regulations, Commandant could consider incorporating the ASTM standards by reference if deemed sufficient and effective. Further, considering accidents occur due to organizational system faults and not specifically linked to one person, the Coast Guard can effectively promote parasail safety through a systems approach that applies enforceable regulations industry wide. Regulations would proactively address known latent unsafe conditions, and guide, encourage, and compel parasail companies, its owners and operators, to promote safety.
3. It is recommended that the Commandant of the Coast Guard continue to promote parasail safety under existing statutory authorities. Efforts include continued involvement in the development of voluntary consensus standards initiatives of ASTM International and industry stakeholders, and existing education and outreach efforts to educate parasail operators.
4. It is recommend that the Commandant of the Coast Guard issue a safety alert or a marine inspection notice that reflects key findings of this report. The safety alert or marine inspection notice should encourage all parasail vessel operators to:
  - a. pay special attention to the prevailing and forecasted weather conditions, and utilize all available means in making weather related assessments, including NWS web pages,

- b. consult industry representatives to ensure that maximum parasail canopy size does not exceed the manufacturers recommendations for the winch on a vessel,
  - c. consult operational manuals and understand the operational characteristics of the parasail winch system, including the inverse relationship of engine RPM to torque,
  - d. conduct parasail operations at locations further offshore to allow greater sea room to respond to high wind situations,
  - e. Connect the parasail towline to the parasail yoke with a means that helps maintain the full breaking strength of the line. Operators should consider alternative to the typical bowline knot, which reduces line strength by as much as 40%, including installation of chaffing devises such as metal hardware (D-rings) or a thimble in the formed eye of the line, and the use of appropriate knots, such as a double figure eight knot or splices that provide greater reliability and strength.
  - f. implement established voluntary industry standards, such as the parasail standards developed by ASTM and WSIA, and
  - g. ensure proper maintenance of all parasail equipment, with particular focus on ensuring all securing A-Frame u-bolt nuts have a means to prevent loosening or backing, and all winch hydraulic lines and systems are leak free and in good working order.
5. It is recommended that Sector Mobile Inspections Division develop and issue a Marine Safety Information Bulletin (MSIB) regarding the key findings of this report. The MSIB should encourage all parasail vessel operators to follow those items listed in paragraph 4 above.
6. It is recommended that Sector Mobile Inspections Division continue to execute its education and outreach programs to promote parasail safety. Such efforts should incorporate published Coast Guard MSIB and Safety Alerts during discussions with parasail operators when conducting routine small passenger vessel inspections and dockside walks. Leveraging participation by the Coast Guard Auxiliary is highly encouraged.

*Enforcement:*

1. It is recommended that Sector Mobile, which exercises Officer in Charge Marine Inspection (OCMI) authority closest to Captain [REDACTED] home of record, conduct a Personnel Action investigation and initiate suspension and revocation proceedings against his Coast Guard credential for negligence and/or misconduct.

*Other:*

1. It is recommended that this casualty investigation be closed.

#