

INVESTIGATION INTO LOSS OF THE MASTER ABOARD AND
SINKING OF THE COMMERCIAL FISHING VESSEL

COSTA & CORVO

IN GEORGES SHOAL ON NOVEMBER 13, 2008

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SUMMARY

On November 13, 2008 after completing the haul back of a fully loaded fishing net, the 74-foot commercial fishing vessel COSTA & CORVO sank approximately 118 nautical miles (NM) East of Nantucket, on Georges Bank. The casualty resulted in one missing crew member who is presumed deceased and a total loss of the vessel. The three surviving crew members were rescued by the fishing vessel MARY K.

On the morning of November 9, 2008, the COSTA & CORVO, with four crew members, departed New Bedford, MA for Georges Bank on a routine ground fishing trip. Weather conditions were fair with light winds, approximately 12 NM visibility, and a calm sea.

On November 12, 2009, one hour prior to the capsizing, the fishing vessel MARY K passed 400 yards east of the well illuminated COSTA & CORVO, which was engaged in fishing. On November 13, 2008 at approximately 0005 the fishing vessels MAYFLOWER and BONANSA which were located approximately nine nautical miles away from the COSTA & CORVO heard a scream and crashing sounds on the radio. No "MAYDAY" or audible words were heard from the radio transmission. The MARY K scanned the horizon but was unable to locate the previously illuminated COSTA & CORVO. The Master of the MARY K notified Coast Guard Sector Boston stating they had lost visual contact with the COSTA & CORVO. During this conversation, the Coast Guard District One Command Center in Boston, MA received the initial Emergency Position Radio Indicating Beacon (EPRIB) distress signal from the COSTA & CORVO. The Coast Guard immediately launched Coast Guard assets and requested that the MARY K proceed to the distress position given by the vessel's EPRIB.

Approximately 45 minutes after the initial distress signal, the MARY K arrived on scene and observed an inverted and keel up COSTA & CORVO. The MARY K located and rescued three crew members clinging to two life rings in the water. All three survivors stated the Master was last seen entering the pilot house as the vessel quickly listed to port and capsized. The vessel sank approximately 90 minutes after capsizing.

The Coast Guard determined that the probable cause of the casualty is attributed to a sudden and dramatic decrease in stability. At the time of the incident, the crew of the COSTA & CORVO were retrieving their nets, had all freeing ports closed to prevent loss of the catch and the vessel was moving forward at a speed of 2-3 knots. The pilothouse and the helm were both unmanned as all members of the crew, including the Master, were on deck. As the fully loaded net was lowered on deck, it abruptly shifted to port causing the vessel to list severely. As the vessel listed to port, the port trawl door, which was loosely secured to the port rail just above the waterline, automatically submerged and directed sea water onto the deck. Additionally, the force of the water over the submerged port trawl door exasperated the situation and drove the vessel further to port. All of these factors triggered a chain of events which lead to the reduction of the vessel's stability and capsizing. With both the pilothouse and engine room doors open, the vessel sank due to progressive down flooding.

Section 1 - FINDINGS OF FACT

1.1 Vessel, general data

Name:	COSTA & CORVO
Owner:	R & P Fishing Corporation 84 Front Street New Bedford, MA 02740
Official number:	587772
Gross Tons:	134
Length	71.4 feet
Breadth:	22.3 feet
Depth:	11.5 feet
Hull design	Offshore, Western rigged dragger
Hull material:	Steel, original hull plating was 3/8 inch.
Propulsion	1 Caterpillar diesel rated at 580 hp.
Build date/location	1977, Atlantic Marine, Fort George Island, FL
Flag:	United States



Figure 1: Picture of the COSTA & CORVO taken in 2007

1.2 Vessel layout of cargo and tank arrangement

Below the main deck, the internal hull was fitted with five transverse bulkheads which divided the spaces into six water-tight compartments.

1. Forepeak water tank
2. Storage compartment over water tank
3. Engine room with integral port and starboard fuel oil wing tanks
4. Fish hold
5. Port and starboard fuel oil tanks
6. Steering gear compartment

Above the main deck, there were four main areas:

1. Forward stowage compartment
2. Crew living spaces (three 2-man staterooms, toilet, and shower)
3. Dining and galley area
4. Pilothouse


TANK	MAX Capacity (Gallons)	EST Capacity At Time of Incident (Gallons)
01- Forepeak (water)	1822	1000
02 Fuel oil port	5927	3000
03 Fuel oil starboard	5927	3000
04 Fresh water port	3967	1983
05 Fresh water starboard	3967	1983
Hydraulic tank	300	180
Lube oil tank	300	150

Table 1: COSTA & CORVO Tank Capacities (information provided by Mr. [REDACTED] on COSTA & CORVO)

Port Cargo Hold	Starboard Cargo Hold
2,700 pounds of skate (1/2 full)	Ice (1/2 full)
6,000 pounds of skate	6,000 pounds of skate
2,500 pounds of flounder	Ice (full)
500 pounds of yellow tail	2,500 pounds of flounder
Empty	300 pounds of cod
Ice <	one compartment from port to starboard >Ice

Table 2: COSTA & CORVO Cargo Hold Capacities at Time of Incident (information provided by Mr. [REDACTED] on COSTA & CORVO)

1.3 Vessel, Personnel

	<p>Master: [REDACTED] DOB: [REDACTED] Time on vessel: Approximately 5 months on board Time in industry: Approximately 25 years Position on vessel: Master Status: Missing and presumed deceased</p>
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<p>Crewmember: [REDACTED] DOB: [REDACTED] Time on vessel: 3 years Time in industry: Approximately 25 years Position on vessel: Engineer Status: Survived</p>
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<p>Crewmember: [REDACTED] DOB: [REDACTED] Time on vessel: 7 months Time in industry: Approximately 25 years Position on vessel: Deckhand Status: Survived</p>

<p>Crewmember: [REDACTED] DOB: [REDACTED] Time on vessel: 10 years Time in industry: Approximately 25 years Position on vessel: Mate Status: Survived</p>

1.4 Vessel, Interview of surviving crew members

On November 13, 2008 at 1900 a Coast Guard Investigating Officer conducted interviews with the surviving crew members from the COSTA & CORVO upon their immediate return to Cape Cod. The crew members were interviewed separately at Coast Guard Station Cape Cod Canal. The interviews were translated (Portuguese) by a member of the Bristol County Sheriff's Department. Also in attendance was the Coast Guard Commercial Fishing Vessel Examiner for Coast Guard Sector Southeastern New England. The three surviving crew members were interviewed separately and describe the same scenario prior to the vessel capsizing. The three surviving crew members stated there were no mechanical or safety issues on the COSTA & CORVO at the time of the incident, other than the malfunctioning auto pilot.

1.5 Vessel, stability

The COSTA & CORVO's regulatory length was less than 79 feet, therefore not subject to 46 CFR Part 28.500 (stability for commercial industry fishing vessels) and not required by current regulations to perform a stability test prior to operating.

*Note: The regulatory length is used to determine stability applicability and for documented vessels is measured from the stem of the main deck to foreside of rudder stock as required in 46 CFR Part 69.

1.6 Vessel, lifesaving equipment

The inflatable life raft aboard the COSTA & CORVO was a Revere 6-person self-inflatable life raft and was properly stowed on the upper deck behind the pilothouse. It was secured to the vessel by a hydrostatic release unit and designed to automatically release at approximately 13 feet of water pressure. As the vessel sank below the surface, the hydrostatic release unit and life raft deployed and inflated as designed. The life raft was located floating in position 41° 36.00'N 067° 39.24'W still tethered to the sunken vessel. The depth of water at this location is approximately 55 feet.

EQUIPMENT	NOTES
(1) 6 person inflatable life raft	Inspected January 2008 Hydrostatic release exp 11/10 Deployed as designed
(1) EPIRB category 1 (406 MHz) (Emergency Position Indicating Beacon)	Hydrostatic release exp 11/10 Battery exp 06/12 Registration # ADCD06FE0050001 Deployed as designed
(4) Survival suits	Manufactured 11/01 with attached CG approved with lights. Inspected by the Coast Guard on 11/6/2008 and were found to be in serviceable condition.
(4) Type 1 Personal Floatation Devices (Lifejackets)	Serviceable, retro-reflective tape and vessel name Inspected by the Coast Guard on 11/6/2008 and were found to be in serviceable condition.
(1) Ocean Service distress signal kit	(1), Para red rocket MK-3 (Exp 10/11) (1), Life smoke orange smoke: (Exp. 10/11) (3), Red MK-7 hand flares (Exp. 10/11) Inspected by the Coast Guard on 11/6/2008 and were found to be in serviceable condition.
(1) VHF-FM Radio	
(3) Life rings	Inspected by the Coast Guard on 11/6/2008 and were found to be in serviceable condition.

Table 3: Lifesaving Equipment carried on board the COSTA & CORVO



Figure 2: Storage locations of EPIRB and Life raft

1.7 Crew Training and Equipment Tests

The following crew members attended a Safety and Survival Workshop in New Bedford, MA. This one day training is conducted by the Coast Guard and certified industry personnel. The training is sponsored by the Coast Guard, City of New Bedford, and the local fishing industry.

██████████ Master	4 April 2005
██████████ Crew member	7 May 2005
██████████ Crew member	17 June 2005

During the November 6, 2008 Coast Guard Voluntary Dockside Examination of the COSTA & CORVO, a review of the vessel's training records indicated that all crew members had conducted monthly emergency drills and familiarization training. A monthly record of EPIRB inspections and tests was also current.

1.8 Weather

The weather forecast issued by the National Weather Service at 2130 November 12, 2008 for the area the COSTA & CORVO was operating predicted SE winds between 10 and 15 knots for Thursday, November 13 and gusts up to 20 knots on Friday, November 14. Seas were forecasted to be between 1 ft and 3 ft with drizzle and some fog possible on Friday, November 14th. Interviews with the three surviving crew members, Masters of the MARY K, BONANSA, and MAYFLOWER indicated ideal weather conditions with light wind, 12 nm visibility, and a calm sea state at the time of the casualty. On November 11, 2009 at 2350 (local), NOAA weather buoy Station 44011 observed water temp of 53° F and air temp of 47° F.

1.9 Commercial fishing vessel safety examination and law enforcement boarding's

The COSTA & CORVO was an un-inspected commercial fishing vessel and as such was not required to hold a Certificate of Inspection from the U. S. Coast Guard. However, the vessel was enrolled in the voluntary Coast Guard Fishing Vessel Safety program.

On November 4, 2008, the COSTA & CORVO underwent an at sea boarding by the U. S. Coast Guard Cutter TYBEE. The vessel was found to have no safety equipment or material deficiencies.

On November 6, 2008, the COSTA & CORVO underwent a voluntary dockside safety exam by a fishing vessel examiner from Coast Guard Marine Safety Detachment New Bedford, MA. The vessel was found to have no deficiencies.

1.10 Trawl doors

The vessel was equipped with two 1100 pound steel trawl doors stored inboard. The trawl doors are designed to flow through the water at an angle causing them to spread away from each other opening the net in a horizontal direction. The trawl doors are attached to the boat by trawl warps. During haul back operations the trawl doors were stowed outboard in preparation for the next pay-out of fishing gear.



Figure 3: Picture of the COSTA & CORVO

1.11 EPRIB (Emergency Position Radio Indicating Beacon)

The 406 Mhz EPIRB was mounted on top of the wheelhouse and was designed to float free at 13 feet of hydrostatic pressure. Coast Guard District One Boston, MA received the EPRIB distress signal confirming the hydrostatic release had ejected, indicating the unit had operated as designed. This crucial piece of lifesaving equipment initiated the Coast Guard Search and Rescue (SAR) case for the COSTA & CORVO.

1.12 Bilge and flooding alarms

Main bilge pumping was accomplished by two (2) installed 1 ½ -inch electrically driven pumps which were capable of dewatering all bilge spaces through a 1 ½ -inch manifold system. This system was equipped with inline check valves. Also, two (2) belt driven dewatering pumps located on the main engine were able to be used for dewatering.

The engine room, lazarette, and fish holds were fitted with high water bilge alarms that sound audibly and visually in the pilothouse. All tested satisfactory during the previous Coast Guard fishing vessel examination.

1.13 Scupper closing devices

The vessel's foredeck area was fitted with a 23-inch high raised solid bulwark fitted with a 3 ½- inch split cap-top, which tapers aft to a height of 8-inches adjacent to the pilothouse. The foredeck area was also fitted with a watertight hatch providing egress from inboard of the bulwark. The raised bulwark of the work deck was 36-inches high and extended the entire periphery of the main deck to the transom. They are continuous forward but rise to meet the pilot house aft foredeck forming a sheltered structure for the winch areas. The bulwarks were fitted with three freeing ports on the port and starboard sides each measuring 17-inches wide by 13-inches tall with guides and gates.

1.14 Watertight Doors and hatches

The forward bulkhead of the engine room was fitted with a watertight door and the aft bulkhead was fitted with a 6-dog split water tight door for access to the cargo deck area. Hatches included an escape hatch located in the forward stowage compartment, for access into the lazarette space. All doors and hatches were inspected during the Coast Guard dockside examination and provided good watertight integrity. Based on interviews with the surviving crew members, the pilot house door was tied open and the aft engine room door was open when the casualty occurred.

1.15 Vessel auto pilot

Based on interviews with the surviving crew members, the vessel's auto pilot became inoperative after the vessel departed New Bedford, MA on November 9, 2008. The Engineer attempted to troubleshoot and repair the autopilot with negative results. The autopilot allows for a vessel to maintain a preset course. Necessary calculations are instantly made and transmitted to the steering engine (power pack) for corrective rudder positions.

1.16 Vessel pilothouse

Based on interviews with the surviving crew members, the Master left the pilothouse to assist the crew on the main deck with retrieving and repositioning the loaded fishing net. During this time the helm was unmanned and the engine was engaged ahead at 2-3 knots. During this time, the vessel's course was subject to alterations caused by hauling in the fishing gear, the vessel's heeling moments, tidal currents, waves and wind.

Section 2 – TIMELINE

2.1 Timeline of Key Events (all times local and approximate)

0900 on November 9, 2008: The COSTA & CORVO, with four crew members, departed New Bedford, MA for a routine ground fishing trip to Georges Banks.

1200 on November 9, 2008: The vessel's auto pilot became inoperative.

1900 on November 12, 2008: The crew of the COSTA & CORVO commenced dragging of fishing gear.

2300 on November 12, 2008: The MARY K passed within 400 yards of the COSTA & CORVO.

0001 on November 13, 2008: The crew of the COSTA & CORVO completed a haul back of fishing gear. Fully loaded fish net lowered on deck.

0002 on November 13, 2008: The fully loaded fishing net shifted to the port side. As the vessel made headway, the vessel continued to roll to the port side. This action allowed the un-secured port trawl door to submerge and hinge out. The trawl door then deflected sea water onto the deck and further degraded the vessel stability increasing the vessel list to port. The vessel subsequently capsized to port.

0005 on November 13, 2008: The Master's of the MAYFLOWER and BONANSA contacted the MARY K stating they heard crashing sounds on the VHF radio. The MARY K relayed this information to Coast Guard Sector Boston, MA.

0008 on November 13, 2008: The Master of the MARY K contacted Coast Guard Sector Boston, MA stating they had lost visual contact with the well-illuminated COSTA & CORVO. It was during this conversation that Coast Guard District One Boston, MA received a distress signal from the EPRIB registered to the COSTA & CORVO. The Master of the MARY K noted the COSTA & CORVO remained on radar and was directed by Coast Guard Sector Boston, MA to proceed to the last known position of the COSTA & CORVO indicated by the initial distress position given by the vessels EPRIB at 41° 41.3 N, 067° 40.0 W. The MAYFLOWER and BONANSA also proceeded to the last known position of the COSTA & CORVO. Several unsuccessful attempts to contact COSTA & CORVO by radio were made by the Coast Guard and vessels in the area.

0045 on November 13, 2008: The MARY K arrived on scene in the Last Known Position given by the EPRIB and observed the COSTA & CORVO capsized. The crew of the MARY K heard yelling from the water, discovered the 3 crew members clinging to 2 life rings and then recovered the crew members. All 3 crew members were dressed in light clothing and not wearing survival suits. Survivors stated to the Master of the MARY K, they observed the Master of the COSTA & CORVO entering the pilothouse as the vessel quickly capsized. The Master of the MARY K relayed all SAR information to Coast Guard Sector Boston, MA and continued search for missing Master.

0050 on November 13, 2008: Coast Guard Air Station Cape Cod aircraft arrived on scene and commenced search for missing Master of COSTA & CORVO.

0059 on November 13, 2008: MAYFLOWER and BONANSA arrived on scene and observed the capsized COSTA & CORVO. Both vessels commenced search for the missing Master of COSTA & CORVO.

0100 on November 13, 2008: Coast Guard Air Station Cape Cod helicopter arrived on scene and lowers EMT on board MARY K to evaluate survivors. All survivors determined to be in good health and MARY K advised by Coast Guard Sector Boston, MA that a Coast Guard cutter was en-route to transfer COSTA & CORVO crew members.

0130 on November 13, 2008: The vessel sank in its Last Known Position with an estimated 7,000 gallons of fuel on board.

0941 on November 14, 2008: Following an extensive search and rescue effort that did not locate the Master, the Coast Guard suspended the SAR operations for the Master of the COSTA & CORVO.

Section 3 - ANALYSIS AND CONCLUSIONS

3.1 ANALYSIS: Situational Awareness (Stability)

A combination of stability factors contributed to the capsizing of the COSTA & CORVO, specifically the shifting on deck of a fully loaded fishing net to the port side. This significant shift in weight combined with a partially submerged port trawl door, an unmanned pilothouse, and an inoperative autopilot created serious stability and topside hazards. The vessel's stability was decreased by the additional weight added by the fully loaded and shifting fishing net on the main deck.

The Master had operated the COSTA & CORVO for 5 months and this was his tenth trip. He was familiar with the vessel's limits, handling abilities, and characteristics. The added weight from this overloaded and shifting fishing net located high on the vessel most likely had a significant negative affect on the vessel's stability, specifically its ability to right itself.

During the retrieval of the fully loaded fishing net the significant weight of the catch kept the vessel on a steady heading. However, once the fishing net was out of the water the vessel's heading was subject to alterations caused by environmental factors. Due to the unmanned helm and inoperative auto pilot no corrective rudder changes were initiated to counter these movements. Once the vessel began to roll onto the port side, it continued over until it capsized.

The majority of the findings of fact indicate the master and crew were not fully aware of the serious impact that the shifting of the fully loaded fishing net on deck would have on the vessel's stability. The heeling of the vessel to port allowed the port trawl door to enter the water deflecting seawater onto the main deck. The large volume of water remained on deck due to the closed scupper devices. The closure of the scuppers is a standard procedure when the fishing net is to be opened on deck and the catch sorted. This is done to prevent the loss of catch over the side. The weight of the seawater on deck caused the vessel to continue heeling over to port. It is believed that the master may have recognized the rapidly deteriorating stability conditions and entered the pilothouse as the vessel began to roll to the port side. The vessel exceeded its righting capabilities, continued to roll to port, and finally capsized.

The surviving crew members were wearing light clothing at the time of the capsizing. The crew members appeared to not be fully aware of the seriousness of the deteriorating stability conditions and did not have any time to don lifesaving equipment.

3.1 CONCLUSION: Situational awareness (Stability)

Based on the findings of fact and analysis above, the crew's situational awareness was compromised by the suddenness of the catastrophic loss of stability that led to the vessel's capsizing. It was determined that the primary cause of the sinking was a loss of stability due to the shifting on deck of a fully loaded fishing net, causing a port list. An unsecured port trawl door further compounded this port list. The port trawl door swung out and deflected seawater onto the deck. The sea water was trapped on deck due to the scupper devices being in the closed position. In addition, an unmanned pilothouse and an inoperative autopilot prevented a compensating course change or a reduction in the throttles, which further added to this unrecoverable list. The combined events eliminated the inherent righting effect of the vessels stability, which caused the vessel to capsize with little to no warning. It can be surmised that due to the light clothing on the surviving crew members, the crew members were not fully aware of the seriousness of the deteriorating stability conditions and were caught off-guard when the vessel listed to port and suddenly capsized.

3.2 ANALYSIS: Material condition of vessel

Interviews with all of the surviving crew members did not reveal any previous unsafe material condition aboard the COSTA & CORVO. The Coast Guard's voluntary commercial fishing vessel exam dated November 6, 2008, describes the COSTA & CORVO as being in good working order with no outstanding safety deficiencies. The Condition & Value Survey Report completed by Marine Safety Consultants Inc. dated June 6, 2006 stated that "The general overall condition of the vessel was found to be very good"; and that "This vessel condition indicates that the present ownership has continually maintained and upgraded the vessel to keep the vessel in good service condition."

3.2 CONCLUSION: Material Condition of the Vessel

Based on the findings of fact and analysis above, it is determined that the vessel was in good condition and that a breach in the hull most likely did not occur. The vessel's material condition was not a factor in this casualty.

3.3 ANALYSIS: Missing Master

The surviving crewmembers stated they witnessed the Master enter the pilothouse as the vessel began to list to the port side and roll. Because the COSTA & CORVO, MAYFLOWER and BONANZA were working together on the same non-standard VHF channel, both vessels heard the inaudible radio traffic from the Master of the COSTA & CORVO as the vessel rolled over. No “MAYDAY” from the COSTA & CORVO was heard on the VHF radio. The Master was not located after the capsizing and it is reasonable to assume that he was immediately subjected to 53° F water, which would have limited his survival time without an exposure suit to 3.9 – 5.0 hours.

3.3 CONCLUSION: Missing crew member

Based on the findings of fact and analysis above, it is determined that the missing Master mostly likely was trapped in the pilothouse as the vessel rolled over. The Master was immediately exposed to the 53 degree water without an exposure suit, which would have limited his survivability to less than five (5) hours based on the Cold Exposure Survival Model. The Master remains missing and presumed deceased.

3.4 ANALYSIS: Deployment of Lifesaving Equipment

The EPRIB, life raft, and life rings deployed and functioned as designed. The EPRIB was stowed on top of the pilothouse roof and deployed via a hydrostatic release when the vessel capsized. The EPRIB transmitted the Last Known Position of the COSTA & CORVO to Coast Guard District One Boston, MA indicating the vessel was in distress. Once the vessel began to sink, the life raft deployed automatically via a hydrostatic release and floated to the surface. The life raft remained secured to the COSTA & CORVO via a 100 foot sea painter line. Both items were retrieved by a Coast Guard cutter and returned to the owner of the COSTA & CORVO after they were examined by the Coast Guard Investigating Officer. Two of the vessel’s three life rings floated free as the vessel capsized. One crew member entered the water with one life ring as the vessel rolled. The three survivors were rescued clinging to two of the vessels life rings. The vessel had the required number of survival suits on board and they were inspected as satisfactory by the Commercial Fishing Vessel Examiner during the November 8, 2008 examination. However, due to the sudden and rapid roll over of the vessel, the crew members had no time to enter the inside of the vessel, retrieve, and don the survival suits.

3.4 CONCLUSION: Deployment of Lifesaving Equipment

Based on the findings of fact and analysis above, the life raft and EPIRB deployed as designed without crew assistance. One life ring was deployed by a crew member and the other two floated free of the vessel. Crew members were unable to don any survival suits or life jackets due to the suddenness of the capsizing. Survivors used 2 life rings as a floatation device until they were rescued.

3.5 ANALYSIS: COSTA & CORVO Stability Requirements

In accordance with regulations the COSTA & CORVO was not required to undergo or meet the regulated stability requirements because the vessel was less than 79 feet in regulated length.

In January 1999, the Coast Guard chartered a task force to review the current fishing vessel safety program and recommend significant measures to reduce loss of life and vessels, which produced the report "Dying to Fish Living to Fish. Recommendation 4.1 of the report recommended stability requirements for commercial fishing vessels greater than, or equal to 50 feet in length.

3.5 CONCLUSION:

We concur with the task force recommendation to require stability letters for all commercial fishing vessels greater than, or equal to, 50 feet in length.

3.6 ANALYSIS: COSTA & CORVO Underwater Survey

On August 11, 2009, the Naval Undersea Warfare Center conducted an underwater survey of the vessel. The information collected by the Naval Undersea Warfare Center (NUWC) was consistent with the details of the incident provided by the Investigating Officer of the U.S. Coast Guard. From the quality of the SONAR images it is clear that the vessel detected is lying on its port side. As imaged from the starboard side, the vessel hull appears to be intact and complete. It is believed the vessel slowly slid down the slope of George's Shoal and now rests in 120ft of water.

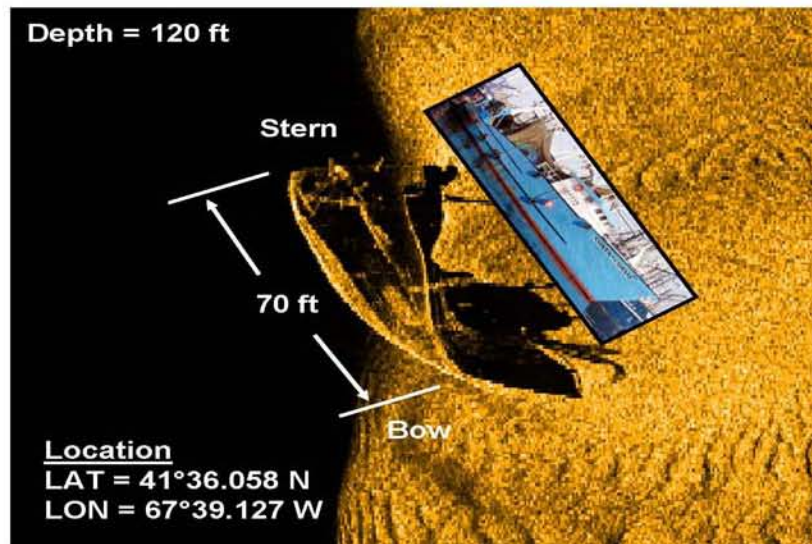


Figure 4: Sunken vessel located near last position of COSTA & CORVO (Image courtesy of Naval Undersea Warfare Center of the Naval Sea Systems Command)



Figure 5: Sunken vessel located in last position of COSTA & CORVO (Image courtesy of Naval Undersea Warfare Center of the Naval Sea Systems Command)

- Vessel Capsizes
- Slowly exchanges trapped air for seawater and remains on surface for about an hour
- Vessel continues to drift submerged while in suspension still releasing trapped air and towing life raft
- Life raft never breaks tether: *Boat never sinks deeper than 100ft (30m)*
- Resultant sink rate is slow and steady over 3 hour period covering 5-6nm

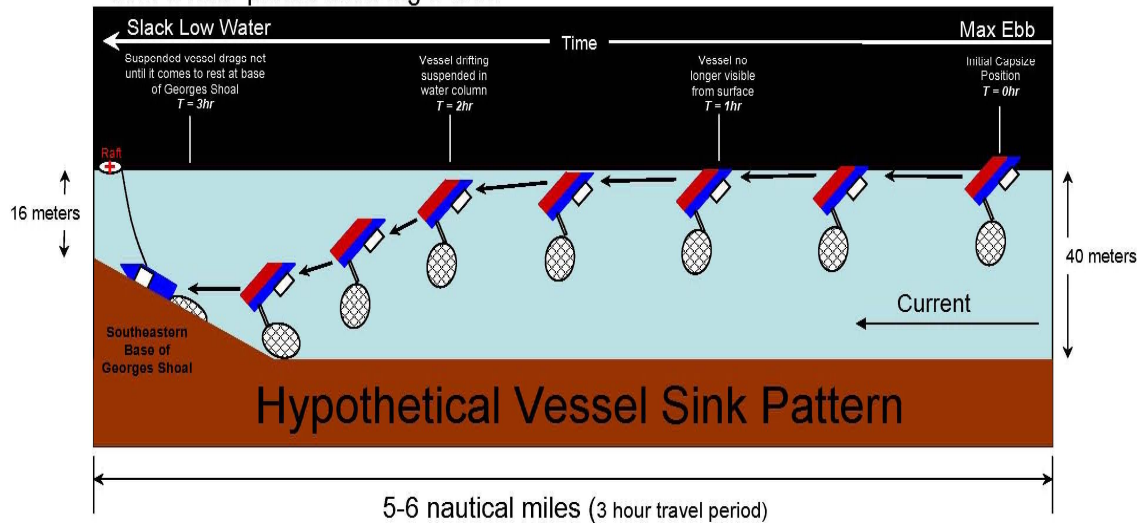
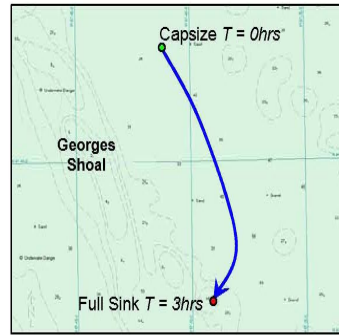


Figure 6: Hypothetical vessel sink pattern on November 13, 2008 (Image courtesy of Naval Undersea Warfare Center of the Naval Sea Systems Command)

3.6 CONCLUSION:

The vessel found during the survey conducted by the Naval Undersea Warfare Center is near the last known position of the COSTA & CORVO and most probably is the COSTA & CORVO. The vessel and associated gear appeared to be intact with no breaches of the hull being readily apparent. The hypothetical vessel sink pattern is derived from the position of the vessel when the crew was recovered and the location that the life raft was located after the vessel sank.

Section 4 - RECOMMENDATIONS

4.1 Re-evaluate need for stability requirements

Recommend that the Coast Guard re-evaluate the need to amend the applicability requirements in 46 CFR 28.500 to lower the stability requirements for commercial fishing vessels from 79 feet and greater in length to 50 feet and greater in length.

Section 5 - ENCLOSURES

5.1 Evidence Index

CONTROL #	DISCRIPTION OF EVEDENCE
3362233-PDW-001	CG-2692 Report of Marine Accident Injury or Death
3362233-PDW-002	Statement from Master of F/V MARY K Mr. [REDACTED]
3362233-PDW-003	Statement from translator Major [REDACTED] Bristol County Sheriff Office
3362233-PDW-004	CG-2692B Report of Required Chemical Drug and Alcohol Testing Following a Serious Marine Incident
3362233-PDW-005	Drug test results and Federal Chain of Custody form for Mr. [REDACTED]
3362233-PDW-006	Drug test results and Federal Chain of Custody form for Mr. [REDACTED]
3362233-PDW-007	Drug test results and Federal Chain of Custody form for Mr. [REDACTED]
3362233-PDW-008	Routine Insurance and Underwriters Condition and Value Survey Report
3362233-PDW-009	Coast Guard Commercial Dockside Examination Summary Report
3362233-PDW-010	Transcribed statement of crew member Mr. [REDACTED]
3362233-PDW-011	Compilation of Findings of Fact not otherwise documented
3362233-PDW-012	Transcribed statement of crew member Mr. [REDACTED]
3362233-PDW-013	National Weather Service Forecast for Georges Bank on November 12-13, 2008
3362233-PDW-014	Vessel Critical Profile from Coast Guard MISLE database
3362233-JGP-015	Survey Results from Naval Undersea Warfare Center of NAVAL Sea Systems Command
3362233-JGP-016	NOAA Weather Buoy Data for Station 44011