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16700
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22 November 1999

From: Senior Investigating Officer, Coast Guard Marine Safety Office, Milwaukee, WI
To: Commander Ninth Coast Guard District (m)
Via: Officer In Charge, Marine Inspection, Milwaukee, WI

Subj: DISAPPEARANCE OF THE COMMERCIAL FISHING VESSEL LINDA E (O.N.
236906), WITH THREE CREWMEMBERS NEAR PORT WASHINGTON, WI ON
LAKE MICHIGAN ON DECEMBER 11, 1998

1. Summary

On December 11, 1998, at approximately 0515 the F/V LINDA E with three persons onboard departed Port Washington, Wisconsin enroute a position nine miles southeast to retrieve and set one of two gangs of gill nets. The last known contact with the LINDA E occurred at 0946 when a representative of Smith Brother Fish Company in Port Washington, Wisconsin called the LINDA E by cellular telephone. The LINDA E would normally return to Port Washington between 1300 and 1500 the same day. The Coast Guard was notified at approximately 2000 that the LINDA E was overdue.

2. Vessel Data

Name: LINDA E
O.N. 263906
Service: Commercial Fishing (gill net)
Gross Tons: 29
Net Tons : 20
Length: 42 ft.
Breadth: 13 ft.
Depth: 4ft 10 in
Propulsion: Diesel MP150
H.P. 150
Built 1937 Burger Boats, Manitowoc, WI
Homeport: Port Washington, WI

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3. Vessel Description and Service

The LINDA E is a typical Great Lakes commercial fishing boat designed to haul and set gill nets. The gill nets themselves are approximately four feet high and vary in lengths up to approximately two miles long. The boat is fully enclosed with no watertight subdivision. A main deck runs for the length of the vessel, with a raised platform at the wheelhouse. The steel hull is completely enclosed with a weather tight steel superstructure. This superstructure is fitted with portholes distributed along the port and starboard side of the main superstructure and facing all directions in the wheelhouse. The portholes are the only means of seeing out of the wheelhouse. There are four sliding metal doors; one aft, one amidships on the port side, and two forward on the port and starboard side. The doors are opened for the crew to work the gill nets; the forward doors are used to retrieve and the stern door is used to set. The vessel was equipped with VHF radio, cellular telephone, radar, magnetic compass, autopilot, personal floatation devices, ring buoy, buoyant apparatus, and exposure suits. The vessel had no bilge level alarm. The gasoline driven bilge pump required manual intervention to start. See enclosure (1 A-C) LINDA E photographs and internal layout of vessel.

4. Record of Missing and Presumed Dead

Three crewmembers are missing and presumed dead:

Name:	Leif E. Weborg	Warren G. Olson Jr.
Age:	61 DOB 04-05-37	45 DOB 09-24-54
Address:	This information has been redacted under the provisions of the Privacy Act of 1974 (5 USC 552a)	
Next of kin:	[REDACTED]	
Position:	Owner/Captain of LINDA E	Crewmember

Name:	Scott T. Matta
Age:	33 DOB 02-27-66
Address:	This information has been redacted under the provisions of the Privacy Act of 1974 (5 USC 552a)
Next of kin:	[REDACTED]
Position:	Crewmember

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5. Weather Data

Based upon the logs of Coast Guard Group Milwaukee and the MICHIGAN, weather and sea conditions on December 11, 1998 were as follows:

Time	Visibility	Winds	Sea State	Air Temp	Water Temp	
0800	7 miles	SW-6kts	calm 1' - 2'	31 F	47 F	
1000	7 miles	SSW-6kts	calm	38 F	47 F	0946 last contact w/vsl
1200	7 miles	SW-5kts	calm	45 F	47 F	
1400	7 miles	SSW-5kts	calm	48 F	47 F	
2000	7 miles	SSW-4kts	calm	38 F	47 F	CG notified missing vsl

6. Summary of Coast Guard and Volunteer Search Efforts

On December 11, 1998 at approximately 2000 the Coast Guard was notified that the F/V LINDA E had not returned to Port Washington as expected. The Coast Guard immediately initiated a search that ultimately covered approximately 3000 square miles of the middle to lower western side of Lake Michigan. Searchers were unable to find any sign of the vessel, including pollution or debris. The Coast Guard suspended its search the evening of December 13, 1998. Continuing efforts by local commercial salvors have as of yet been unable to locate the LINDA E.

7. Summary of Investigation

On December 13, 1998, the Coast Guard initiated an investigation into the disappearance of the LINDA E. The Coast Guard investigated 26 commercial vessels that may have transited the western portion of Lake Michigan on December 11th between 0900 and 1500. Coast Guard Investigators boarded and interviewed the crews of several vessels. They also took paint samples from one vessel for comparison against a can of paint believed to have been used on the LINDA E. Coast Guard investigators interviewed forty commercial fishermen between Baileys Harbor, Wisconsin and Milwaukee, Wisconsin, an official from the Wisconsin Department of Natural Resources and others with knowledge of commercial fishing in Lake Michigan in search of witnesses and to obtain information regarding typical fishing practices. Through family members, close friends and acquaintances familiar with the LINDA E, investigators gathered information on repair and maintenance history of the vessel. With the assistance of the Coast Guard Marine Safety Center, investigators collected measurement data and conducted a stability test onboard a similarly constructed fishing vessel, the MERCURY. This data was used to conduct a computer analysis to determine strength and stability characteristics of the LINDA E. Marine Safety Office, Milwaukee continues to support private parties searching for the LINDA E by providing information regarding the whereabouts of the vessel's nets and operation area.

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8. Findings of Facts

a. In 1996 the entire hull of the LINDA E was re-plated over its existing hull from below the rub rail to the keel. The new 3/16 inch steel plates were welded around the perimeter and slot welded to the existing plate.

b. The LINDA E was enrolled the U. S. Coast Guard Dockside Courtesy Commercial Fishing Vessel Examination program and was last inspected on May 30, 1997. Several minor discrepancies were found and corrected on the spot. See enclosure (2). Upon completion of the examination, the vessel was found to be in substantial compliance with Title 46, Code of Federal Regulation, Subchapter C.

c. At the request of Leif and Sherry Weborg, the Coast Guard exempted the LINDA E from the requirements of Title 46 Code of Federal Regulation (CFR), Subchapter C to carry an Electronic Position Indicating Radio Beacon (EPIRB) and an inflatable buoyant apparatus, subject to specific additional operational requirements. See enclosure (3).

d. In the Summer of 1998, the forward deck area was lowered two inches in way of the fish cleaning area to increase headroom. According to the welder who performed this modification, the transverse framing and deck plating were replaced in kind.

e. The LINDA E was usually only used in Fall/Winter conditions because of its reinforced hull for icy conditions. The LINDA E's first fishing voyage in Fall/Winter 1998 was on December 07, 1998. The vessel had been laid up in the water for several months previous to this date. The LINDA E was used every day thereafter, from December 7th through the 11th.

f. The LINDA E with three persons onboard departed from Port of Washington at 0515 on December 11, 1998 and did not return. The operator of the F/V D & S recalled seeing the LINDA E at approximately 0815 on the above date while he was fishing 4-5 miles south of the LINDA E's fishing area. At approximately 0946, Mr. Bruce Rassmusen of Smith Brother Fish Company in Port Washington called the LINDA E by cellular telephone. Mr. Scott Matta informed him that they were still hauling nets and that the LINDA E expected to return with approximately 1000 pounds of fish. This was the last known contact with the LINDA E.

g. Cellular telephone records for Leif Weborg indicate that no other calls were completed or connected after the 0946 telephone call. See enclosure (4).

h. On December 11, 1998 at 2000 the United States Coast Guard Group Milwaukee was notified that the LINDA E was overdue with three persons onboard. The Coast Guard conducted an extensive search covering 3000 square miles until the search was suspended on December 13, 1998 at approximately 2000. Coast Guard personnel also performed shore side

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patrols to search for evidence of a casualty. No vessel, persons, debris or pollution were found.

i. The LINDA E had one 300 gallon fuel tank that was filled at the beginning of the season. After three fishing trips, the vessel is believed to have had 250 gallons remaining. The LINDA E also had on board 15 gallons of crankcase oil and various other fluids, including: hydraulic fluid, gear oil, and antifreeze.

j. No distress calls from the LINDA E were received by VHF radio or cellular telephone on December 11th, 1998.

k. Mr. Leif Weborg was known to work two gangs of gill nets. These nets were found, properly set, with their buoys at approximate positions N43⁰ 14' 29"- W087⁰ 43' 08", N43⁰ 14' 27" – W087⁰ 46' 08", N43⁰ 15' 44" – W087⁰ 42' 50", N43⁰ 15' 44" – W087⁰ 45' 45". This is approximately nine miles southeast of Port Washington, Wisconsin, approximately five to six miles offshore. See Figure 1 on page (8).

l. A fisherman and acquaintance of Leif Weborg recovered both gangs of nets several days following the disappearance; the south gang of nets was found to have been retrieved more recently than was the north gang.

m. Fishing vessel operators in Lake Michigan are known to clean fish and perform housekeeping duties on the boat while underway and occasionally leave the wheelhouse unattended for extended periods.

n. The LINDA E was not required to meet the stability requirements of Title 46 CFR 28.570 and 28.575 because of its length. However, a stability analysis performed by the U.S. Coast Guard Marine Safety Center (MSC) determined that, based upon the most likely loading condition of the vessel at the time of its disappearance, the LINDA E met the Torremolinous Convention stability criteria and International Maritime Organization (IMO) Severe Wind and Rolling Criteria. Although there is no established stability criteria for commercial fishing vessels of less than 79 feet, this criterion is recommended for use by Navigation and Vessel Inspection Circular 5-86, Voluntary Standards for Commercial Fishing Vessels, as the most relevant for purpose of determining the adequacy of the LINDA E' s stability. See enclosure (5) Report for the MSC findings.

o. The stability analysis performed by the MSC also determined that, even in the hypothetical case of having its bilges flooded and an accumulation of ice upon its the superstructure, the LINDA E still had substantial positive stability.

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- p. The weather conditions on the day of this incident were not favorable for ice to accumulate on a vessel. No vessel in the area that day reported icing.
- q. The LINDA E had no longitudinal watertight subdivision and therefore any breach of the watertight envelope, if unchecked, would cause the vessel to sink. (Watertight subdivision is compartmentation of a vessel to improve the ability of the vessel to remain afloat after damage.) Calculations by the MSC indicate that flooding through a opening the size of the sliding doors would cause the LINDA E to sink within seconds while flooding through an opening of 2.5" in diameter, such as that from a failed fitting, would take over an hour to sink the vessel.
- r. The cellular telephone and VHF radio for the LINDA E operate off the same power source. It is unknown whether or not the cellular telephone had an independent battery, or the condition of this battery if it existed.
- s. Very little is known about the material condition of the hull or equipment of LINDA E at the time of its disappearance.
- t. An integrated tug, M/V MICHIGAN O.N. 650770, and barge, BARGE GREAT LAKES O.N. 650771, transited the waters off Port Washington, WI between 1130 and 1205 on December 11, 1998. Of the twenty-six vessels we investigated, this Integrated Tug and Barge (ITB) combination is the only known vessel to have transited this area around this time. This ITB has an overall length of 454' and breadth of 60'. The barge was in a ballasted condition with drafts of 13 feet forward, 14 feet aft. See enclosures (6 A-B) M/V MICHIGAN Ship Logs and Figure 1 on page (8).
- u. M/V MICHIGAN crewmembers stated that they did not see the LINDA E, debris or other vessels in the area during their transit.
- v. As indicated in the vessel's logs, the 1120 position of the ITB MICHIGAN/GREAT LAKES was N43⁰-20', W087⁰-44'. The most likely track line of the ITB is charted below in Figure 1.
- w. The mate, Scott Gorney, relieved the master, Keith Grady, of the navigation watch at 1130. Mr. Gorney stated that he did not observe any vessel contacts on radar or visually while transiting the waters off Port Washington. Mr. Gorney stated that Mr. Grady passed no contacts to him.
- x. Mr. Gorney performed chart corrections during this watch.

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- y. The radar on the M/V MICHIGAN was usually set for a 6 or 12 nautical mile range. Neither Mr. Grady nor Mr. Gorney could recall what scale the radar was set during their watch.
- z. On December 11th, 1998 at 1100 the azimuth of the Sun was 169⁰T and at 1200, 184⁰T. The heading of the M/V MICHIGAN was approximately 189⁰T.
- aa. When the M/V MICHIGAN is in the notch with the barge GREAT LAKES in ballast, the visibility of the operator in the pilothouse is restricted for some distance just forward of the barge. However, even in this condition of loading, the ITB MICHIGAN/ GREAT LAKES met the visibility requirements of Title 33 CFR 164.15.
- ab. The portholes scattered around the main deck and pilothouse of the LINDA E afford limited visibility. There are some blind spots, most notably the blind area caused by the exhaust stack forward and to the starboard of the wheelhouse.
- ac. The height of eye from the pilothouse of the LINDA E was approximately 6 feet above the waterline. The maximum height of the superstructure of the LINDA E was approximately 8 feet above the waterline. The height of eye from the tug M/V MICHIGAN was (42) feet. The maximum height of the superstructure of the M/V MICHIGAN was (46) feet. Therefore the computed geographic visibility from the LINDA E to the M/V MICHIGAN is 8.1 nautical miles. The computed geographic visibility from the M/V MICHIGAN to the LINDA E was 11 nautical miles. Both these distances exceed the reported visibility of 7 miles on December 11, 1999.
- ad. It is reportedly a common practice for operators of fishing vessel of this type to rely on autopilot while all persons on board are cleaning fish and the vessel returns to port. An ex-crewmember from 2 years ago indicated that while serving on the LINDA E with Leif Weborg as captain that autopilot was commonly used to steer the vessel while crew cleaned fish.
- ae. These types of fishing vessels reportedly trim severely by the stern at speeds at or near their maximum speed. The exact hullform, weight distribution and propulsion system of the LINDA E was unique to this vessel and not known to a certainty. As these factors greatly influence the amount of trim, the resulting magnitude of the reduction in freeboard at the transom of the vessel cannot be determined with any degree of certainty.
- af. The bottom of Lake Michigan off Port Washington is made of clay with no known rock outcroppings and no submerged hazards, which would have interfered with the navigation of the LINDA E. The depth gradually decreases from the fishing area into Port Washington.

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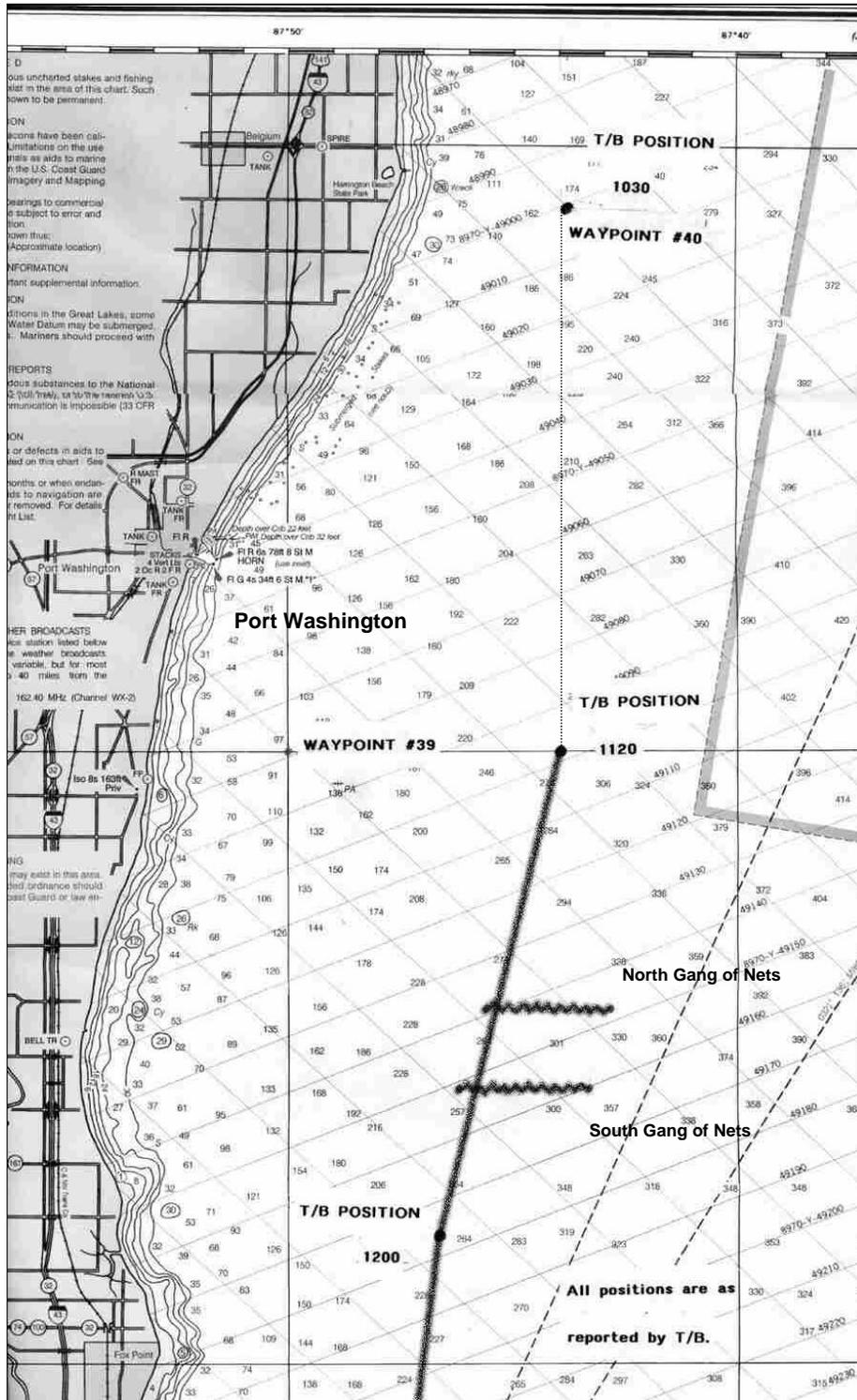


Figure 1

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ag. Coast Guard investigators boarded the barge GREAT LAKES in a ballasted condition with draft readings of 13 feet forward and 14 feet aft.. They found white and black markings on the stem and starboard bow hull plating areas of the barge GREAT LAKES. See enclosure (7 A-B) photographs of the ITB M/V MICHIGAN and BARGE GREAT LAKES and marks on the bow. These marks extended from approximately two to eight feet from the barge's waterline. The white markings were of chalky consistency, were easily removed, and appeared to be embedded into the barge hull's black paint. The black markings had a powdery consistency. Samples of the white markings were taken and compared with both a can of white paint that may have been used to paint the LINDA E and paint samples taken from the commercial fishing vessel OLIVER M SMITH, also owned by Lief Weborg.

ah. Analysis by the Wisconsin Department of Justice Crime Laboratory indicated that neither of the two sources believed to be consistent with the paint on LINDA E matched the samples from the BARGE GREAT LAKES. See enclosure (8). Samples of the black markings were also collected and tested, but no meaningful information could be obtained. The crewmembers who were onboard the M/V MICHIGAN on December 11th 1998 did not know the source of these marks. They stated that the tug and barge usually moors to its port side. Interviews with the relief crew revealed no explanation for marks on hull.

ai. Based upon the most likely loading conditions of the LINDA E at the time of the casualty, the MSC calculated that the white superstructure of the LINDA E extended between approximately two and eight feet above the surface of the water.

9. Analysis:

There were no witnesses to this casualty and no physical evidence from the LINDA E has yet been located. Based upon the facts above, the following possible causes appear unlikely: fire, explosion, and grounding. The facts available lead to certain possible causes of this casualty, but fail to conclusively identify any possibility as more likely than another. The most plausible probable causes are described below:

a. Collision with another vessel.

This possibility is supported by the fact that the most likely trackline of LINDA E crosses the trackline of the M/V MICHIGAN/BARGE GREAT LAKES. However, the location of the LINDA E is not known after 0946, and the ITB did not enter the area until sometime around 1100. Hence there is a significant amount of time unaccounted for and ample opportunity for these vessels to pass clear of each other without seeing one another or for the LINDA E to sink before the ITB passed through. Human factors such as the azimuth of the sun and restrictions on visibility from the wheelhouse of the LINDA E and pilothouse of the M/V MICHIGAN support the proposition but do not prove that a collision occurred. Similarly, work practices such as cleaning fish and performing

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housekeeping in the interior of a boat without a wheelhouse watch or performing non-watch activities such as updating navigation charts and publications while on watch, also support but do not prove such a conclusion. The markings found on the BARGE GREAT LAKES are indicative of a possible collision. However, as scientific analysis determined that the samples were not from a common source, no meaningful conclusion can be drawn from this evidence.

b. Collision with a partially submerged object.

Although those searching for the LINDA E after the incident noted no partially submerged objects, objects capable of damaging a fishing vessels hull, such as massive wooden mats with protruding bolts, have been sighted in these waters. There are a number of possible sources of this kind of navigation hazard from vessels and shore. The restricted visibility from the pilothouse of the LINDA E would make detection of such hazards very difficult. Striking a heavy or sharp object could result in penetration of this relatively lightly constructed hull. The lack of watertight subdivision, bilge level indicating alarm, or automatic bilge pumping equipment, indicates any penetration of the watertight envelope, if unchecked, could result in the sinking of the vessel.

c. Structural Failure

There are a number of potential causes for the hull of the LINDA E to fail. Lacking further evidence, we cannot prove or disprove a structural failure.

(1) Corrosion: The bilges of the LINDA E were filled with permanent ballast and therefore were not easily examined or maintained. The amount of corrosion to the inner hull plating or structural members is not known, and could have been sufficiently advanced to result in a hull breach.

(2) Weld Failure: Any failure in any of the slot weld or seam welds around the outer hull would allow the ingress of water between the inner and outer plates. This water could freeze and cause structural damage, with the potential for a serious hull failure.

(3) Material Fatigue: Most of the structure of the LINDA E was over 60 years old. The working of a vessel in a seaway results in fatigue loading: a continuous cycle of tensile and compressive stress in a hull structure that may lead to failure over time. While fatigue limits can be built into steel structure, the design limitations of this hull are not known. It is likely that over the course of its life, the hull material of this vessel saw hundreds of thousands of loading cycles, possibly enough to have resulted in failure by fatigue.

(4) Maintenance and Workmanship: As the structural modification and maintenance is not part of the Coast Guard commercial fishing vessel's examination program, we cannot

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preclude poor workmanship or inadequate maintenance as possible causes of this casualty.

d. Failure of a Hull Fitting:

A hull fitting may have failed but, due to the time that it would take the vessel to sink from such a failure and lack of a distress call, this appears less likely than other possible causes.

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10. Conclusions

- a. The LINDA E is presumed to have sunk off Port Washington.
- b. The LINDA E crewmen Leif Weborg, Scott Matta, and Warren Olson are missing at sea and presumed dead.
- c. The apparent cause of this casualty cannot be determined based upon the information currently available.
- d. The lack of a distress call and fact that no survival equipment was located may indicate that the LINDA E sank quickly. However, the possibility remains that there is some other reason that those on the vessel failed to make a distress call.
- e. Weather and sea state do not appear to be factors in this casualty.
- f. Based on the last contact with the LINDA E regarding the expected size of it's catch and the stability analyses performed, it is not likely that the vessel was overloaded or that the vessel suffered from inadequate intact stability. However, if flooding occurred for any reason, the vessel might founder very quickly depending on the source and location of the flooding.
- g. Had the LINDA E carried an EPIRB, the Coast Guard might have been able to begin its search earlier. In addition an EPIRB might have helped to condense the search area.
- h. Not maintaining a continuous live watch at the main steering station, where the operator has an unobstructed view, increases the likelihood of collision.
- i. There is no evidence that fatigue contributed to this casualty.
- j. There is no evidence that drugs or alcohol contributed to this casualty.
- k. There is currently insufficient information available to support or disprove the conclusion that there is evidence of actionable misconduct, negligence, inattention to duty, or willful violation of law or regulation on the part of any licensed or certificated persons.
- l. There is no evidence that any personnel of the Coast Guard, or any other government agency, or any other person contributed to this casualty.

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11. Recommendations

- a. That the Commander, Ninth Coast Guard District examine the exemption policies for carriage of EPIRB's on all commercial fishing vessels operating on the Great Lakes.
- b. That MSO Milwaukee publish the contents of this investigation as a safety advisory to all commercial vessels operating in Lake Michigan. That a copy of this investigation report be provided to the State of Wisconsin and local agencies responsible for investigating boating accidents.
- c. That this investigation be closed with the understanding that it will be re-opened pending receipt of information sufficient to determine the apparent cause of the LINDA E's disappearance, and that MSO Milwaukee continue to support and coordinate with state and local law enforcement authorities investigating this incident.

J. P. BURK
Senior Investigating Officer

Enclosures: (1 A-C) LINDA E'S photographs and interior layout,
(2) LINDA E'S corrected discrepancy list
(3) CGD9 exemption letter for LINDA E
(4) LINDA E Cellular Telephone Bill
(5) USCG Marine Safety Center Casualty Analysis Report
(6 A-B) M/V MICHIGAN Ship Logs
(7 A-B) ITB MICHIGAN & GREAT LAKES photographs
(8) Wisconsin Department of Justice Crime Lab Report (2)