MARINE CASUALTY REPORT

MV THERESA F.
CAPSIZING IN GULF OF MEXICO
ON 9 JANUARY, 1969

U.S. COAST GUARD
MARINE BOARD of INVESTIGATION REPORT
and COMMANDANT'S ACTION

ACTION BY
NATIONAL TRANSPORTATION SAFETY BOARD

DEPARTMENT OF TRANSPORTATION
WASHINGTON D.C. 20591

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CAPSIZING OF THE M/V THERESA F. IN THE GULF OF MEXICO ON JANUARY 9, 1969

ACTION BY THE NATIONAL TRANSPORTATION SAFETY BOARD

This casualty was investigated by a U. S. Coast Guard Marine Board of Investigation convened at New Orleans, Louisiana, on January 14, 1969. A Member of the National Transportation Safety Board attended the proceedings as observer. We have reviewed the investigative record and considered those facts which are pertinent to the Board's statutory responsibility to make a determination of cause or probable cause and make recommendations to prevent recurrence.

SYNOPSIS

The M/V THERESA F., a towing vessel owned by Midland Enterprises, Inc., and operated by the Red Circle Transport Co., capsized and sank at about 2015 c.s.t. on January 9, 1969, in the vicinity of Southwest Pass Sea Buoy at latitude 28° 52.9' N. and longitude 89° 25.6' W. Of the 10 persons aboard, three crewmembers died as a result of this casualty; six crewmembers and a bar pilot survived.

The THERESA F. was engaged in moving the barge FREEPORT I, owned and operated by the same company, from Tampa, Florida, to Uncle Sam, Louisiana. This barge and the THERESA F. were designed and built to operate as a unit. At the time of the casualty, the barge was being towed astern by the THERESA F.

SUMMARY OF FACTS

The towing vessel M/V THERESA F. was an uninspected vessel of 196.5 gross tons and equipped with two diesel engines producing 5,000 total horsepower. She was on her second trip in the Gulf of Mexico at the time of the casualty. This vessel was built in 1968, and specifically designed to push or pull the inspected seagoing barge FREEPORT I, which displaces 26,000 tons. The barge was built with a notch in her stern and, in favorable weather, the towing vessel pushed the barge. In adverse weather, the FREEPORT I was towed astern. This barge was fitted with two movable

skegs astern, which were positioned inboard for pushing, and positioned outboard for towing astern. A 100-kw. generator on the barge provided the power to position the skegs through a hydraulic ram system. Two 10-kw. generators were also installed on the FREEPORT I. The large generator required at least 100 p.s.i. of air pressure to start it. The 10-kw. generators were battery started, and were the source of power for the air compressor used to provide air to start the large generator.

Prior to sailing from Tampa on January 7, the master of the THERESA F. reported to a supervisor of the operating company that the two small generators would not operate. He was informed that if the weather was favorable for pushing, the towing vessel could supply power to the barge using an electric connecting cable. This was the master's first trip in the Gulf, handling the FREEPORT I. He had previous offshore towing experience, but none with barges fitted with movable skegs. The master telephoned a private meteorologist in New Orleans and obtained a weather forecast which he considered suitable for pushing the barge ahead. The 100-kw. generator was in operation when the tow sailed from Tampa, but was stopped during the morning of January 8, and the electric cable was connected from the tug.

The weather deteriorated during the day of January 8, and the towing vessel started "banging around in the notch." After checking the weather forecast from Mobile, the master decided to take the barge in tow astern. Efforts to start all three generators failed. The electric power cable from the THERESA F. had been disconnected and the skegs remained positioned for pushing. The barge was towed astern, with no trouble experienced in controlling it until the hawser was shortened and speed was reduced as the tow approached Southwest Pass. When the hawser was shortened to 350 feet, the barge ran wild, from one side to the other. The THERESA F. circled to the right, awaiting the pilot, and the barge responded better in the turn. The wind was from the north 20 to 30 knots, and the seas from the south, resulting in confused and choppy waves of 4 to 5 feet in height. Sea conditions were too rough for the towing vessel to make up in the notch of the barge.

The pilot boarded the THERESA F. and advised the master to delay entering Southwest Pass until other traffic cleared the channel. After the traffic cleared, the tug was steered on a course of 350° true, lining up on the entrance range lights. The barge ran erratically from side to side. At 2015, the barge exerted a severe strain on the hawser, and was on the starboard quarter of the THERESA F., headed about 45° to the right of the towing vessel's heading. The strain pulled the towing vessel over to starboard. She righted herself, then about 2 seconds later took another severe roll to starboard, lay over on her beam-ends, and then capsized. The power failed before the master could broadcast a distress message on voice radio.

The master, pilot, and lookout climbed out pilothouse windows, and worked their way to the port side where the chief engineer had inflated the 12-person liferaft. All but two crewmembers escaped from the sinking vessel. The cook climbed through a porthole on the port side. Seven persons boarded the inflatable raft, but one able seaman could not swim to the raft, which sailed downwind out of his reach. This seaman was wearing a life preserver, but had no light. The master fired flares which were sighted by personnel on the Yugoslavian M/V ZLETOVO. The pilot signaled this vessel with a flashlight. A pilot boat from the Southwest Pass Pilot Station had been unable to raise the THERESA F. on channel 13. The boat was directed to the location of the liferaft, and the survivors were transferred to the ZLETOVO. The pilot boat requested the pilot station to alert the Coast Guard of the capsizing. Coast Guard aircraft arrived at 2045, the CG RELIANCE at 2213, and searched for possible other survirors. The body of the able seaman was recovered the next day about 60 miles offshore, still wearing a life preserver. The bodies of the two crewmembers trapped in the vessel were recovered several months later, after the THERESA F. was raised for salvage.

ANALYSIS

A number of causal factors contributed to the capsizing of the THERESA F. The most significant factors will be considered, in the order of the occurrence of events.

The master of the THERESA F. was making his first trip with the barge FREEPORT I in the Gulf of Mexico from Tampa, Florida, to Uncle Sam, Louisiana. He had previous experience in offshore towing, but had not handled large barges fitted with movable skegs. Other experienced personnel had advised him that these barges ran wild unless the skegs were properly set for pushing ahead or towing astern. Apparently, no instructions by supervisory officials, nor written operating instructions or manual were furnished him.

He reported to the vice president for operations of Midland Enterprises, the operators, that neither 10-kw. generators was operable. No repairs were made prior to his departure from Tampa. He was advised that as long as the weather was favorable for pushing ahead, electric power could be supplied from the THERESA F., via a cable, and the 100-kw. generator could be secured. This advice, in effect, negated the redundancy of the backup system of two 10-kw. generators and 100-kw. generator on the barge. The malfunctions of the two smaller generators ultimately resulted in the inability to start the 100-kw. generator and to reposition the skegs for towing astern.

The master telephoned a private meteorologist in New Orleans, and received a weather forecast which he considered favorable enough to warrant pushing the barge. The distance from the sea buoy off Tampa to Southwest Pass is 360 miles, thus at 10 knots, 36 hours are required to cross the Gulf. The fact that the master sailed indicated that he received a favorable weather forecast for 36 hours from the evening of January 7. Thus, the decision-making process was left to the judgment of the master, who was not familiar with the operation of the system.

The skegs were positioned 15° inboard for pushing ahead, and the 100-kw. generator was in operation when the tow cleared the sea buoy off Tampa. The following morning, the electric power cable from the towing vessel was connected to the barge and the generator secured. Based upon this action, it would appear that the master considered the weather forecast favorable. Later, when the seas built up, and he considered it unsafe to continue to push the barge, the skegs were not repositioned outboard for towing astern, prior to disconnecting the electric power from the THERESA F. This action, followed by the inability to start any of the three generators, led to the barge's ultimately running wild and tripping the towing vessel.

The air pressure on the barge available to start the 100-kw. generator was about 85 p.s.i., and a pressure of 100 p.s.i. was required to start it. Since the small generators which furnished power to the air compressors were inoperative, there was no way to increase the air pressure to the required 100 p.s.i. Concern of the master for the safety of personnel on the barge influenced his decision to get the THERESA F. out of the notch as quickly as possible, and not take time to reconnect the electric powerline and to reposition the skegs for towing astern. His lack of understanding and experience with movable skegs, and lack of an operating manual or specific guidance, also contributed to his failure to reposition the skegs for towing astern. The master did not recognize the significance of his action. This decision was a prime causal factor leading to the casualty.

The FREEPORT I towed astern satisfactorily until the towing hawser was shortened to 350 feet as the tow approached the sea buoy off the Mississippi River Southwest Pass. A choppy sea, resulting from the 20 to 30-knot northerly wind against a southerly swell, prevented the THERESA F. from making up in the notch of the barge. The barge followed fairly well as the tow circled to the right, awaiting the arrival of the pilot and the traffic to clear in the entrance. It was not until the THERESA F. steadied on the range course of 350° true that the barge started running from side to side. Apparently, the master did not anticipate the sudden sheer the FREEPORT I took, until it was too late to compensate for the strain. It is possible that he could have averted capsizing by turning the towing vessel to the left, putting the lead of the hawser directly astern, and slowing.

The winch was not of a constant-tension design. A constant-tension winch set to provide a margin of safety might be effective in preventing this type of tripping casualty.

Once the barge took a sheer to the right of the base course, the angle of strain on the towing hawser, combined with the increase in strain caused by the sheer, and the momentum of this large barge (26,000 displacement tons), quickly tripped the much smaller (196 gross tons) towing vessel. Corrective action might have been possible had a closer surveillance been maintained of the movements of the FREEPORT I.

Flooding followed quickly, and power was lost on the THERESA F. There was insufficient time to broadcast a distress message on the towing vessel's voice radio. No emergency portable radio was available.

It is possible that all hands would have perished had the towing vessel not been equipped with an inflatable liferaft. Due to the suddenness of this casualty, it would have been impossible to launch a lifeboat. This casualty illustrates the superiority of a liferaft over a lifeboat in its effectiveness as a piece of survival equipment under the conditions encountered. Current regulations do not require either a liferaft or lifeboat on board such towing vessels as the THERESA F. Previous casualties, such as the F/V FENWICK ISLAND, which have come before this Board, focus attention on the need for liferafts on board seagoing vessels which currently are not included under the regulations.

In the dark, persons in the water would have been very difficult to locate, as the life preservers were not fitted with lights. The flares provided in the liferaft and flashlight used by the pilot resulted in the detection of the liferaft by the bridge watch on the ZLETOVO. The Safety Board has recommended that life preservers be fitted with waterproof lights in the reports of the foundering of the SS PANOCEANIC FAITH and F/V FENWICK ISLAND. Appropriate changes in the applicable regulations to implement this recommendation are under consideration by the Coast Guard. It was also noted that the cook on the THERESA F. escaped from his room through a porthole. The Board has previously noted the effectiveness of portholes as an alternate means of escape in the GULFSTAG, AFRICAN STAR, and UNION FAITH reports, and recommended that the Coast Guard regulations for tank and cargo vessels provide a minimum clearance of 16 inches in diameter on manually operable air ports in berthing compartments above the main deck. This recommendation is currently under consideration by the Coast Guard.

Two crewmembers were trapped, and perished. The other crewmember who died was unable to reach the liferaft which drifted downwind out of his reach. He was wearing a life perserver without a light. It is possible that he would have survived had he been able to signal the pilot boat which rescued the seven persons in the liferaft.

The stability of the THERESA F. appeared to be adequate. However, the Safety Board is concerned that similar casualties may occur to other relatively small tugs pushing large barges at sea. The oceangoing tug-barge concept is gaining favor in this country, and some barges are as large as seagoing ships. Considerable forces will be produced by the working of the tug in a seaway, while positioned in the notch, and damage is likely to result.

This case clearly illustrates the need for operational analysis of towing vessel operations, and development of operating manuals for guidance of seagoing personnel.

PROBABLE CAUSE

The National Transportation Safety Board finds that the cause of this casualty was a combination of the angle of strain on the shortened towing hawser and the sudden increase in strain imposed on the THERESA F. as the relatively large barge FREEPORT I took a sheer to her starboard, tripping the towing vessel, and capsizing her. This sheer resulted from a combination of wind and sea conditions, and the skegs having been set inboard for pushing the barge. Malfunctioning of the three generators on the barge resulted in the skegs' improper positioning for towing astern. The incorrect analysis by the company official and master, of the importance of maintaining the 10-kw. generator in operating condition, as an integral part of the backup system, were causal factors. Also, the master's failure to position the skegs for towing astern prior to disconnecting the electric power from the THERESA F. was a significant causal factor. Other factors contributing to the casualty included: the deterioration of the weather; the master's lack of offshore experience with tows fitted with movable skegs; failure to keep the barge under constant surveillance; and lack of a constant-tension winch.

RECOMMENDATIONS

The Safety Board concurs in the recommendations of the Marine Board of Investigation which were approved by the Commandant. In addition, it is recommended that:

1. The Coast Guard, in its study of towing vessel operations, include the need for a constant-tension winch on offshore towing vessels. This is considered of particular importance on large oceangoing tug-barge units under construction or operation.

2. The Coast Guard require battery-powered, waterproof lights be provided with life preservers, which are required by present regulations.

3. The Coast Guard, in its study, consider requiring inflatable liferafts, on offshore towing vessels, of sufficient capacity to accommodate all persons on board.

4. Operators of offshore towing vessels and seagoing barges utilize operational analysis to develop operating instructions, manual, or checkoff lists which will clearly convey guidelines for safe operating methods, including the proper use of electrical, steering, and towing systems.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

Adopted this 3rd day of February, 1971:

[redacted] Chairman

[redacted] Member

[redacted] Member

[redacted] Member

[redacted] Member

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to
COMMANDANT (MVI-3)
U.S. COAST GUARD
WASHINGTON, D.C. 20591

. 5943/THERESA F
A-8, Bd

15 APR 1970

Commandant's Action

on

The Marine Board of Investigation convened to inquire into the circumstances surrounding the capsizing of the M/V THERESA F with the barge FREEPORT I in tow in the Gulf of Mexico on 9 January 1969 with loss of life.

1. The record of the Marine Board of Investigation convened to investigate subject casualty has been reviewed, and the record, including the Findings of Fact, Conclusions, and Recommendations, is approved subject to the following comments and the final determination of the cause of the casualty by the National Transportation Safety Board.

SYNOPSIS OF INVESTIGATIVE REPORT FINDINGS OF FACT

1. The M/V THERESA F, while approaching Southwest Pass, Mississippi River, with the barge FREEPORT I in tow, capsized in the Gulf of Mexico at approximately 2015 CST, 9 January 1969. Three persons lost their lives.

2. While the barge which was being towed by a 350 foot nylon pendant was running erratically from side to side, the THERESA F took a severe roll to starboard, returned to an upright position and then took a second roll to starboard from which it did not recover. At the time of the casualty, the barge was on the tug's starboard quarter heading out and away from the tug, while the bow of the barge was nearly abreast of the stern of the tug.

3. The after ends of the two skegs fitted at the stern of the barge FREEPORT I are adjustable. The selective position that can be made to the skegs include "TOW LOADED," "PUSH LIGHT," and "PUSH LOADED." When towing, the skegs are positioned all the way outboard to improve trailing characteristics. When pushing, the skegs are aligned to reduce resistance. On the voyage from Tampa, Florida the tug THERESA F was pushing the barge FREEPORT I. When the weather worsened the tug got out of the pushing notch of the barge, retrieved the towing pendant and made up for towing. The skegs were not altered from "PUSHING" to "TOWING" position due to a lack of electrical power. None of the generators on the barge were in operating condition. The master did not use power from the tug because of the rapid deterioration of the weather causing the tug to violently strike the barge in the notch.

REMARKS

1. Concurring with the Marine Board of Investigation, it is considered that the cause of this casualty was the heeling moment imposed on the THERESA F by the towing pendant leading over her starboard quarter after the barge FREEPORT I took a sheer due to improperly positioned skegs which allowed the barge to yaw.

2. A study of vessels engaged in towing operations has been initiated.

3. Upon approval by the National Transportation Safety Board this report will be published in the "Proceedings of the Merchant Marine Council" alerting operators of towing vessels of the lessons to be learned from this type of casualty.

[redacted]

W. J. SMITH
Admiral, U. S. Coast Guard
Commandant

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to:
COMMANDER
Eighth Coast Guard District
Customhouse
New Orleans, La. 70130

5943/M/V THERESA F
Marine Board of
Investigation
5 September 1969

From: Marine Board of Investigation
To: Commandant, Coast Guard (MVI)

Subj: M/V THERESA F. O.N. 516158; capsizing in Gulf of Mexico on 9 January 1969, with loss of life

Findings of Fact:

1. At or about 2015 CST on 9 January 1969, while enroute from Tampa, Florida, to New Orleans, Louisiana, the M/V THERESA F capsized approximately 0.4 mile northeast of the Southwest Pass Sea Buoy (LL 2150 in latitude 28 degrees 52.9'N, longitude 89 degrees 25.6'W(USC&GS Chart 1272). After shortening hawser and steadying on a northerly heading at reduced speed in preparation for entering Southwest Pass the loaded barge FREEPORT I, in tow of the THERESA F, began running erratically from side to side. With the unmanned barge FREEPORT I on her starboard quarter the THERESA F took a severe roll to starboard followed by a second heavy roll to starboard from which it did not recover. There were nine crewmembers and one bar pilot on board the THERESA F. Three of the crewmembers lost their lives as a result of this casualty.

2. The following are the particulars of the vessels involved:

Name:	THERESA F	FREEPORT I
Official No:	516158	514966
Service:	Towing	Seagoing Barge
Gross Tons:	196.48	10851
Net Tons:	133	10851
Length (LBP):	132.5	470.0
Breadth, Molded:	34.5	80.0
Depth, Molded:	20.29	42.5
Propulsion:	Diesel - Two GM Model 16-645-Turbo charged Diesel Engines, Twin Screw	N/A
Horsepower:	5000	N/A
Home Port:	Cincinnati, Ohio	Cincinnati, Ohio
Where Built:	McDermott Shipyard Morgan City, Louisiana	Avondale Shipyard New Orleans, Louisiana
Date Built:	1968	1968

Owners:	Midland Enterprises, Inc. 1400 Provident Tower Cincinnati, Ohio	Midland Enterprises, Inc. 1400 Provident Tower Cincinnati, Ohio
Operators:	Red Circle Transport Co. Post Office Box 6098 New Orleans, La., 70114	Red Circle Transport Co. Post Office Box 6098 New Orleans, La., 70114
Master:	Paul H. Tullis 616 Memorial Highway Tampa, Florida, 33615 License: 356754 Certificate: Z-1153909	Unmanned
Last Inspection for Certification:	Uninspected	Initial Inspection
Date/Port:	Uninspected	15 June 1968, New Orleans, La.

3. List of dead and injured:

a. The following crew members lost their lives as a result of this casualty. Their bodies have been recovered and identified:

Name and Address:	Capacity	Next of Kin
Cecil M. Futch, Age [redacted] [redacted]	Able Seaman	[redacted] Wife [redacted]
Joseph H. Riffe, Age [redacted] [redacted]	Assistant Engineer	[redacted] Wife [redacted]
Domingo R. Molina, Age [redacted] [redacted]	Able Seaman	[redacted] Wife [redacted]

b. The following surviving crew member was incapacitated in excess of 72 hours by a bruised right leg:

Name and Address:	Capacity
[redacted]	Able Seaman

6. The weather in the general area of the casualty was: A confused sea of 4 to 6 feet with swells from the south; northerly winds from 20 to 30 knots; visibility 10 miles; clear skies and no precipitation. The wind had shifted abruptly from southerly to northerly at about 1600 on the day of the capsizing.

7. The tug THERESA F is equipped with two (2) pilothouses (the upper one constructed of aluminum), has an overall length of 145 feet, beam of 34.5 feet and a 19 foot operating draft above design base line. The tug is designed with a 5.0 foot drag. The molded keel line amidship is 2.23 feet above the design base line. The draft marks on the tug are measured from the design base line, not from the keel. The draft marks are located in this manner so that when the tug is operating at her design drag, the draft readings fore and aft will be the same. A towing winch, located aft of the deck house, has 2400 feet of 2-1/4" wire. The wire leads from the top of the winch drum, a distance of five feet above the main deck. When the tug is in the notch of the barge and pushing, power can be made available to the barge by a cable from the tug. The tug is secured in the pushing position by two backing wires leading from the stern of the barge to the stern of the tug. The wires are shackled into a flounder plate which is hauled tight by a towing winch wire. The THERESA F had an Interim Class Certificate for towing service (Maltese Cross A1, Maltese Cross AMS) and an International Load Line Certificate (1966) issued by the American Bureau of Shipping.

8. The barge FREEPORT I is 472.5 feet length overall, 80 feet wide and 42.5 feet depth with an operating draft of 30 feet. It features rotary plow feeding for the self discharging system. The barge is employed to transport phosphate rock from Tampa, Florida, to Uncle Sam, Louisiana. A stern notch is provided for pushing the tow as a single unit. In adverse weather the barge is towed. A 350 foot, 12 inch nylon pendant and chain is led through the bull nose of the barge for towing. Two (2) 10 KW diesel driven generators which may be started by batteries, and one (1) 100 KW generator started by air, are on the barge. The 10 KW generators are operated underway to provide power for lights and barge machinery such as bilge pumps, air compressor and remote anchor drop. Starting air for the 100 KW generator is maintained by an automatic air compressor. Power for the air compressor is supplied by either the 10 KW generators or by the cable from the tug.

9. Two (2) skegs are provided at the stern of the FREEPORT I, port and starboard. These skegs are triangular in shape and are approximately 50 feet long, extending from the base line to the bottom of the barge. They toe in 5 degrees towards the centerline going aft. The after ends of the skegs are adjustable. The adjustable portions are about 24 feet high and 16 feet long, shaped to fit the lines of the barge. They may be secured in seven (7) different positions ranging from zero degrees (fore and aft) to fifteen (15) degrees either side in increments of five (5) degrees. To simplify the proper positioning of the skegs for operating personnel, three (3) markings were placed for positioning as follows:

"TOW LOADED" which placed the skegs fifteen (15) degrees outboard; "PUSH LIGHT" which placed the skegs five (5) degrees inboard; "PUSH LOADED" which placed the skegs fifteen (15) degrees inboard. When towing,

the skegs are positioned all the way outboard (fifteen degrees) to provide more resistance and thereby improve tracking or trailing characteristics. When pushing, the skegs are aligned to reduce resistance and improve efficiency. The skegs are actuated by an electric hydraulic pump and ram. Power for the system is provided by either the cable hook-up from the tug or the 100 KW generator on the barge.

10. The tug THERESA F and the barge FREEPORT I were designed to operate together. The company also operates a sister tug, the ALISON C and a sister barge FREEPORT 2. These two sister tugs and barges are interchangeable. The ALISON C commenced operations in June 1968 and had completed 15 round trips prior to the casualty. This was the second round trip for the THERESA F.

11. The Master of the THERESA F, [redacted] was [redacted] years of age. He had been working on tugboats for 12 years including 18 months as Master. In October 1966, he was licensed to serve as Master of freight and towing vessels of not over 500 gross tons upon oceans; also first class pilot of steam and motor vessels of not over 300 gross tons upon the St. Johns River from the Main Street Bridge, Jacksonville, Florida, to the sea; and radar observer, FCP, S&M, 500 GT, Tampa & Hillsborough Bays to Tampa, Fla; FCP, S&M, any GT, Lower Mississippi River between the Huey P. Long Bridge, La. and the sea via South Pass; FCP, S&M, any GT, Lower Mississippi River between Huey P. Long Bridge, La. and Thirty-Five Mile Point Light (Mile 130.1 AHP). This was his first trip across the Gulf on the THERESA F, having relieved as Master in Tampa just prior to the voyage. He had, however, shifted barges with her around the Mississippi River-New Orleans area. He had never been employed on the sister tug, ALISON C, but had served as Master of a slightly smaller but similar tug-barge combination, the tug GAIL B and the barge MARTHA B. The barge MARTHA B has fixed skegs which toe out going aft.

12. The tug THERESA F. pushing the barge FREEPORT I laden with 24,500 short tons of phosphate rock, departed Tampa, Florida, at about 1935 CST on 7 January 1969 and cleared the sea buoy at 0100 CST on 8 January 1969 bound for New Orleans, Louisiana. The skegs were in the "PUSH LOADED" position. Normally, one 10 KW generator would be in operation at sea but before departure on this voyage neither of the 10 KW generators could be put on the line and the barge departed with the 100 KW generator in operation. The Master had been advised by supervisory shore personnel that he did not have to leave the 100 KW generator running since he could use power from the THERESA F if he thought he could push all the way. The Master was of the opinion that the weather would be favorable for pushing. The mean draft of the THERESA F upon departure, Tampa, was approximately 18 feet 6 inches, with a 3-4 foot trim by the stern in addition to the design drag. This resulted in a freeboard amidships of about 4.0 feet. Her assigned summer freeboard was 2 feet 8.5 inches.

13 About 0600 CST on 8 January 1969, at sea, the Master had the 100 KW generator shut down and hooked up the tug's cable for power. About 1500 CST the bow of the tug started "banging around in the notch" and the Master ordered his crew to prepare to get out of the notch, due to increasing

seas and an unfavorable weather report. The power cable from the tug to the barge was secured by the engineer of the watch and the Mate attempted to start the 100 KW generator. He was unable to start it and summoned the Chief Engineer. The Chief Engineer boarded the barge and found the air receiver pressure gauge showing 80 psi, which was below that normally required to start the 100 KW generator (100 to 150 psi required). He tried without success to start the 100 KW generator with the remaining air pressure. He also tried without success to place a 10 KW generator in operation in order to build up air pressure.

14. The Master decided to let go and get out of the notch. No further attempts to provide power for adjusting the skegs were made due to the increasing seas and his urgency to get out of the notch. The tug let go from the notch, proceeded forward, picking up the towing pendant by the retrieving line, shackled up for towing using 1200 to 1500 feet of wire towing hawser, and proceeded to the vicinity of Southwest Pass, Louisiana. During the voyage to Southwest Pass the barge was towing generally off to the port side. Upon a course change from 284 degrees T to 270 degrees T, a little before 1600 CST on 9 January 1969, it commenced running from side to side, 25 degrees either way. The tug and tow averaged approximately ten (10) knots during this voyage at full throttle, steering by gyro pilot.

15. Shortly after 1600 CST on 9 January 1969, the Mate then on watch, notified the Master that they were approximately 16 miles from the Southwest Pass Sea Buoy. About 20 minutes later, the Master told the Mate to shorten the hawser. They proceeded on slow ahead, taking in the hawser. Five (5) miles off the sea buoy, the Master temporarily stopped shortening the hawser and increased speed to three quarters (3/4). At this time there were about 500 feet of wire hawser out. The Master called the Southwest Pass Pilot Station for a pilot. He informed them that he would be at the sea buoy about 1915 CST, and would attempt to make up in the notch outside the river entrance. Two and a half (2-1/2) to three (3) miles from the sea buoy, the Master reduced speed to dead slow (2-1/2 to 3 knots) and began shortening the towing hawser again. He informed the pilot that he was going to go inside the sea buoy to size up the sea conditions. If they were favorable, he would make up in the notch. He continued shortening the hawser until only the 350 foot nylon pendant was out. About one-half (1/2) mile from the sea buoy, the Master informed the pilot by radio that it was too rough to make up in the notch, and he would take her in on the hawser. The barge continued to run from side to side. The pilot informed the Master of outbound traffic and an inbound Yugoslavian ship and suggested that he wait. The Master agreed, and started a slow swing to the right. He completed a circle to the right, straightened out on a northerly heading, and then turned right to make a lee for the pilot to board. The Master and the Chief Engineer were on watch having taken over at 1800 CST. The deck crew had been called out on standby for shortening the hawser and remained on standby. The navigation lights on the tug and the barge were burning properly.

16. The pilot left the dock at 1925 CST and boarded the THERESA F at 1950 CST, approximately one (1) mile southeast of the sea buoy. The Master, at the wheel of the THERESA F, and one A.B. lookout ([redacted] were in the lower pilothouse. Due to an outbound tanker's intention to go eastward, the pilot suggested they continue the right turn. About 2000 CST, they completed the second circle, headed toward the jetty and straightened out on a heading of 350 degrees T. The Master increased speed to slow ahead (3 to 4 knots). The tug passed approximately 1/4 mile to the east of the sea buoy.

17. The barge, on the pendant as before, followed astern of the tug very well during the turns. After steadying out on a northerly heading, the barge again began running erratically from side to side. At about 2015 CST, the THERESA F took a severe roll to starboard, throwing the pilot off his feet. The Master, bracing himself, directed a spotlight back on the barge which was then on his starboard quarter, heading slightly out, away from the tug, the bow of the barge being nearly abreast of the stern of the tug. The tug returned to an upright position without heeling to port. A few seconds later it took a second roll to starboard from which it did not recover, remaining on its side.

18. The Master was bracing himself on the radar adjacent to the wheel. On the second roll, as the vessel continued heeling heavily to starboard, he fell. Water was entering the pilothouse through the loosely dogged starboard door. He managed to get to the first window on the port side of the pilothouse, lowered it and climbed out. The pilot had also fallen down, sliding to starboard as the vessel capsized. He followed the Master out the window. The Master and pilot went down the outboard port side of the pilothouse and encountered the Chief Engineer, who had already launched the inflatable life raft from the cabin deck. Other crew members also appeared at the scene. The Master jumped and made it to the life raft. Others jumped into the water and were pulled aboard the raft. The lookout, Nunnery, made his way to the upper pilothouse and escaped through a window.

19. The Chief Engineer was on watch and the only person in the engineroom at the time of the casualty. When the tug heeled over more than usual on the first heavy roll to starboard, he went to the upper level and started aft toward the engine room door on the main deck. This door, which is on centerline just forward of the towing winch, was open. He saw the wire hawser spark and slip upward into the upside down "U" frame installed over the top of the towing bitts. On the second roll to starboard, believing that the THERESA F was not going to right herself, he made his way over the towing engine, grabbed a work vest which was hanging there, and got up on the port side of the tug. He released the inflatable life raft and stood by until he was washed off by the seas. He saw the cook come out from his room porthole.

20. The Mate, in his room reading, was alarmed by the first severe roll. He started to put his shoes on, but, on the second roll, decided to leave his shoes and get out on deck. The tug was on its side as he got his room door open. He stood on the door sill from which he could reach the port outside door above him at this time. He undogged the door and pushed it open. He heard some of the crew below trying to find their way out and yelled to them that the door was open. He remained there long enough to help Ordinary Seaman [redacted] and Able Seaman C. M. Futch out. The Chief Engineer shouted that he had the raft over. The Mate, who did not have a life preserver, and [redacted] made their way toward the raft. Both Futch and [redacted] had on life preservers.

21. A total of seven persons made their way to and aboard the raft. The Master got out equipment and flares and the Mate cut the painter releasing the raft from the tug. At about the same time they sighted Futch about 10 feet off in the water and could hear him shouting. He did not seem to be able to make his way to the raft. By the time the Master assembled the oars, Futch disappeared and the raft was blown away by the wind. The Master shot off a parachute flare and burned several hand flares. The Yugoslavian M/V ZLETOVO approaching the sea buoy, sighted the parachute flare, and proceeded toward the raft, locating it with her searchlight. The pilot of the ZLETOVO advised the Pilot Station of the situation by radio. The pilot boat returned from the station and towed the raft to the ZLETOVO.

22. The M/V ZLETOVO was boarded by Pilot [redacted] at about 2020 CST, 4 to 5 miles SSE of the sea buoy. The pilot, unable to contact the THERESA F on VHF Channel 13, checked with the Pilot Station. They had not seen the THERESA F. A couple of nips could be seen on the ZLETOVO's radar, which appeared to be a little west of the sea buoy. The Master informed the pilot that he thought he saw a flare also a little west of the sea buoy. Shortly thereafter, they saw another flare and commenced working the ship in that direction. Next, they sighted a small flashing white light. Using their searchlight, they sighted an orange rubber raft. The pilot notified his station to alert the Coast Guard and Pilottown Headquarters of the situation. The ZLETOVO made a lee for the raft while the pilot boat was coming out. The pilot boat reported sighting the capsized THERESA F, to the pilot on the ZLETOVO. He then asked the pilot station to alert the Coast Guard that a tug had capsized and would require all possible assistance.

23. While waiting for the pilot boat, one of the crew of the ZLETOVO reported to the Master that he thought he heard a voice in the water to starboard. The Master had the entire ship's crew man the rails and hung cluster lights over the side. The pilot directed the pilot boat to make a search in the vicinity prior to going to the raft. After searching about a half hour without results, the pilot boat took the raft in tow to the ZLETOVO, and the survivors were taken aboard. Shortly thereafter, the CGC RELIANCE (WMEC 615) came on the scene as well as Coast Guard helicopters and aircraft. The ZLETOVO remained on the scene asisting in the search until released by the CGC RELIANCE at about 0200 CST. They carried the surviviors to New Orleans.

24. The liquid conditions of the THERESA F upon departure, Tampa, was approximately as follows: All tanks not listed were empty:

Liquid	Frame	Sounding	Percent Full	Long Tons
Diesel Oil, CL	7-13	- -	98	56.7
Diesel Oil, Day Tank	19-21	Full	100	10.4
Diesel Oil, P	42-50	15'1-1/2"	90	70.5
Diesel Oil, S	42-50	15'1-1/2"	90	81.2
Diesel Oil, CL	50-56	2' 10"	15	4.0
			Total fuel Oil....	222.8

Liquid	Frame	Sounding	Percent Full	Long Tons
Potable Water	22-26	- -	100	16.2
Hydraulic & Lube Oil	42-44	- -	50	5.7
Salt Water Ballast, P/S	56-64	Full	100	119.4
Salt Water Ballast, Skeg	- -	Full	100	10.5
			Total Liquids.....	374.6

Prior to the casualty, approximately 11,200 gallons (36.1 long tons) of diesel oil were used from the pair of tanks between frames 42-50 and 2200 gallons of water (8.1 long tons) were used from the potable water tank frames 22-26. All other tanks remained the same. The diesel oil day tank was full.

25. Based upon the liquid loading condition at the time of capsizing, the stability condition of the THERESA F was approximately as follows:

a. Displacement - 1005 long tons
b. Draft - 17.8 feet
c. VCG (corrected for free surface) - 18.3 feet above the baseline
d. GM (corrected for free surface) - 2.8 feet
e. GM required - wind heel criteria - 2.0 feet
f. GM required - Coast Guard horsepower criteria 1.9'
g. Dynamic Stability
   (1) Angle of Maximum Righting Arm - 20 degrees
   (2) Righting Arm at 30 degree heel - 0.60 feet
   (3) Areas under Righting Arm Curve - FT - Degrees
      (a) From 0-30 degrees - 15.6
      (b) From 0-40 degrees - 22.2
      (c) Between 30 degrees and 40 degrees - 6.5
h. Approximate Angles to Possible Down Flooding:
   (1) Main Deck Airport into Galley - 36 degrees
   (2) Forecastle Deck Watertight Doors - 55 degrees
   (3) Forecastle Deck Airports into Quarters - 62 degrees
   (4) Air Intake to Engineroom - 63 degrees
   (5) Lower Pilot House Door - 74 degrees
   (6) Engineroom Door, Main Deck on Centerline - 80 degrees

26. The THERESA F had life preservers on board for all hands, plus some work vests. Of the survivors, only [redacted] was wearing a life preserver. Two of the deceased, Futch and Molina, had on life preservers when recovered. The Chief Engineer was wearing a work vest. The only other lifesaving appliance used was the twelve (12) man inflatable life raft which was launched at the time of the capsizing.

27. At 1300 CST on 12 January 1969, the M/V PATHFINDER retrieved the body of Cecil M. Futch in Block 162 South Timbalier area, about 60 miles southwest of Southwest Pass. He was wearing a life preserver stamped with the name THERESA F. The M/V PATHFINDER took the body to Gulf Oil Rig 177B in position latitude 28 degrees 30' N, longitude 90 degrees 22' W, where it was further transferred to the CGC POINT LOOKOUT. At 2100 CST on 12 January at Grand Isle, the body was released to the Jefferson Parish Coroner for transportation to Gretna, Louisiana. The body was identified as that of Cecil M. Futch. The Certificate of Death indicates the cause of death was asphyxia due to drowning. He was buried at Cross City Cemetery, Cross City, Florida, on 15 January 1969.

28. Subsequent to the casualty, the capsized (bottom side up) THERESA F was towed to shallow water, to the west and in the lee of Southwest Pass for salvage operations. It was rolled over on its side with slings, but, due to weather, was allowed to sink to the bottom in 55 feet of water in latitude 29 degrees 00' N, and longitude 89 degrees 33' W. The FREEPORT I was taken in tow at 0620 on 10 January 1969 and brought to New Orleans, Louisiana.

29. The THERESA F was raised from the ocean floor on 12 June 1969 by the Atlantic and Pacific Salvage Company. It was towed partially submerged, bottom side up, to Port Nickel, Louisiana, arriving there on 14 June 1969. While at Port Nickel, the THERESA F was righted and dewatered. On 20 June 1969 it was towed to the Bermuda Street Wharf to be cleaned out. On 25 June 1969 the THERESA F was brought to Eastern Associated Terminals, New Orleans, Louisiana, where it is moored pending contractural arrangements to reactivate the vessel and place it back in operation.

30. At about 2300 CDT on 19 June 1969 the body of Joseph Homer Riffe was found in the athwartship passageway, starboard side, between his room and the Master's room. The bulkhead panels of both rooms had been carried away and the Master's safe was over Riffe's badly decomposed body. There was no evidence of his having worn a life preserver. The body was subsequently released to the Plaquemine Parish Coroner. The Certificate of Death indicates the cause of death was drowning. He was buried at Ross Cemetery, Boyd Co., Kentucky, on 26 June 1969.

31. At about 1000 CDT on 22 June 1969 the body of Domingo R. Molina was found in his room, portside forward. The body was in the lower bunk clothed in a sweat shirt, sweat pants and a life preserver. The body was released to the Orleans Parish Coroner. The Certificate of Death indicates the cause of death as "marked post mortem" due to or as a consequence of "decomposition." He was buried at St. Louis Cemetery #3, New Orleans, Louisiana.

32. No distress message was transmitted by the M/V THERESA F. The first notification of alarm for her safety was received from the pilots at Pilottown, Louisiana, by the U.S. Coast Guard Rescue Coordination Center at New Orleans, Louisiana, at 2110 CST, 9 January 1969. The CGC RELIANCE (WMEC 615) arrived on scene at 2213 CST, commenced surface search and assumed on scene commander status. Search operations were completed at 1345 CST on 11 January 1969. Search and rescue statistics are as follows:

Unit	Hrs Underway/Flown	Sorties
SW Pass Pilot Boats	6.0	2
M/V ZLETOVO	5.5	1
CGC RELIANCE	40.0	1
HU 16E 1265	5.5	1
HU 16E 1272	6.0	1
HH 52A 1391	5.5	1
HH 52A 1372	13.7	4
Totals:	85.2	11

CONCLUSIONS

1. The cause of the casualty was the heeling moment imposed by the towing pendant leading over the starboard quarter of the THERESA F while the barge FREEPORT I was on a sheer to starboard while running erratically from side to side on a shortened hawser. The primary cause of the sheering (running from side to side) of the barge was the improper positioning of the adjustable portion of the twin skegs of the FREEPORT I accentuated by the shortened hawser. The reduction in speed, the prevailing wind, and the confused seas were contributing factors since the barge had been trailing behind the tug better on other courses and speeds. These factors, however, should not have caused problems if the vessels had been operated properly. Other contributory factors were the failure of the Master to keep track of of the position of the barge which was sheering from side to side; his lack of awareness of the effect of the heeling moment imposed by a tow of such great size on his quarter on a short hawser; and his failure to maneuver the THERESA F in such a manner as to reduce the heeling moment after the barge got on the starboard quarter. There is no evidence that the THERESA F suffered any impairment in stability before she was tripped by the towing line to the barge. There is no evidence that the THERESA F had insufficient stability for normal towing operations. There are no established criteria or stability standards for towing vessels that would prevent tripping by large tows being towed on a hawser under any and all conditions. Proper operation continues to be an important consideration in the safe navigation of towing vessels, especially those with large tows.

2. When the 100 KW generator could not be started the Master should have reconnected the tug's power cable long enough to re-position the skegs for towing astern notwithstanding the fact that the bow of the tug was "banging" in the notch. The Master's decision not to reconnect the tug's power cable was a crucial error in judgment, which is attributed to his limited operational experience in towing barges with adjustable skegs.

3. There was also an error in judgment on the part of the Master and his shoreside supervisor in allowing the FREEPORT I to sail with both 10 KW generators inoperative. These generators provided power for lights, bilge pumps and the air compressor. Through lack of air the 100 KW generator could not be started resulting in improper positioning of the skegs that led to the casualty.

4. There is no evidence that any law or regulation relating to vessels has been violated.

5. There is no evidence that any personnel of the Coast Guard or any other government agency contributed to the casualty.

7. There were no aids to navigation or any uncharted or incorrectly charted objects or areas involved in this casualty. There was sufficient water in the vicinity of the casualty to rule out the possibility of the barge grounding.

8. The casualty may have been prevented:

a. If the adjustable skegs had been properly positioned for towing astern. The proper position of the skegs in this case was in turn dependent upon the proper operation of the 10 KW generators for starting air, the proper functioning of the 100 KW generator or the use of power from the towing vessel to operate the hydraulic rams for positioning of the skegs.

b. If the Master had been keeping track of the position of the barge in relation to the THERESA F, if he had realized that the tug was in a precarious position with the towing pendant leading over the starboard quarter, and if he had maneuvered the tug to reduce the heeling moment.

RECOMMENDATIONS

1. That a study of vessels engaged in towing operations be conducted to determine the adequacy of existing practices and requirements. In the interim the dissemination and publication of this report should alert the operators of towing vessels to the inherent dangers involved, with particular reference to, (a) the positioning of skegs where adjustable type skegs are employed on barges, (b) the condition of generators and essential machinery, and, (c) an alert watch to detect sheers that might result in the tripping of vessels towing large barges astern.

[redacted]

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