



16732/MC96000914

AUG 7 1998

**FIRE AND GROUNDING OF THE TUGBOAT SCANDIA, O.N. D517785, AND
GROUNDING OF THE TANK BARGE NORTH CAPE, O.N. D591040, OFF POINT
JUDITH, RHODE ISLAND ON JANUARY 19, 1996, WITH MAJOR POLLUTION AND
NO PERSONAL INJURIES OR LOSS OF LIFE**

ACTION BY THE COMMANDANT

The report of the Investigating Officer and forwarding comments of the Commanding Officer, Marine Safety Office Providence and the Commander, First Coast Guard District have been reviewed. The report is approved subject to the following comments:

ACTION ON RECOMMENDATIONS

Recommendation 1: That Commandant (G-M) consider undertaking a regulatory project to require fixed fire fighting and ventilation control systems for machinery spaces on new and existing uninspected towing vessels.

Action: We concur with the intent of this recommendation. After consulting with the Towing Safety Advisory Committee, the Coast Guard published a Notice of Proposed Rulemaking (NPRM) entitled "Towing Vessel Safety" on October 6, 1997. The NPRM proposed a combination of fire protection measures, but did not specifically include ventilation control systems. The proposed requirements were intended to prevent a loss of propulsion or navigation capability. The NPRM was intended to address the human element, recognizing that proper preparation and response by vessel crew is as important as requiring the installation of additional equipment on the vessel. Therefore, the NPRM proposed crew training, both ashore and afloat, and muster lists to identify and practice crew fire fighting roles before a fire emergency. Many existing towing vessels are constructed with engine rooms that would not support the installation of ventilation control systems without cost-prohibitive modifications. However, when a towing vessel is fitted with a fixed fire fighting system as the NPRM proposed for new vessels, ventilation control systems would be required. The Coast Guard is presently evaluating all of the comments received and may change the proposed rules or propose additional rules as a result of those comments.

Recommendation 2: That Commandant (G-M) consider undertaking a regulatory project to limit the use of combustible materials in the construction and outfitting of new uninspected towing vessels.

Recommendation 3: That Commandant (G-M) consider undertaking a regulatory project to limit the use of combustible materials in the construction and outfitting of existing uninspected towing vessels.

Action: We do not concur with recommendations 2 and 3. The Coast Guard does not presently have statutory authority to regulate the use of materials in the construction of these vessels. Further, Executive Order 12866 of September 30, 1993 – Regulatory Planning and Review - requires federal agencies to identify and assess available alternatives to direct regulation whenever practicable. The Coast Guard has adequately addressed this issue with its existing guidance and information to the marine industry about the use of combustible materials in the construction and outfitting of vessels. Navigation and Vessel Inspection Circular (NVIC) No. 4-82, *Uninspected Commercial Vessel Safety*, and NVIC No. 9-97, *Guide to Structural Fire Protection*, provide extensive information on fire protection measures for owners and operators of uninspected vessels, for classification societies, and for vessel service and repair yards.

Recommendation 4: That Commandant (G-M) consider undertaking a regulatory project to require smoke detection systems with remote alarms for all machinery and accommodation spaces on new and existing uninspected towing vessels.

Action: We concur with the intent of this recommendation. After consulting with the Towing Safety Advisory Committee, the Coast Guard published a Notice of Proposed Rulemaking (NPRM) entitled "Towing Vessel Safety" on October 6, 1997. The NPRM proposed the installation of a heat or smoke detection system in the engine room and a general alarm system in accommodation and work spaces for new and existing uninspected towing vessels. The Coast Guard is presently evaluating all of the comments received and may change the proposed rules or propose additional rules as a result of those comments.

Recommendation 5: That Commandant (G-M) consider undertaking a regulatory project to require independently driven fire pumps, remotely operable from outside of machinery spaces, on new and existing uninspected towing vessels.

Action: We concur with the intent of this recommendation. After consulting with the Towing Safety Advisory Committee, the Coast Guard published a Notice of Proposed Rulemaking (NPRM) entitled "Towing Vessel Safety" on October 6, 1997. The NPRM proposed the installation of fire pumps and fire main systems for all new and existing towing vessels, and proposed different requirements depending on a vessel's length and date of construction. These differences recognize space limitations and the difficulties associated with installing equipment on existing vessels. For new vessels 24 meters or more in length, the NPRM proposed a fixed fire pump and a fire main that are independent of the bilge and ballast system. For new vessels less than 24 meters in length, the NPRM proposed a fixed or portable fire pump. For existing vessels greater than 24 meters in length, the NPRM proposed a fixed fire pump and a fire main. For existing vessels less than 24 meters in length, the NPRM proposed installing a fixed or portable fire pump within two years. The proposed regulations include performance standards for the systems. The Coast Guard is presently evaluating all of the comments received and may change the proposed rules or propose additional rules as a result of those comments.

Recommendation 6: That Commandant (G-M) consider undertaking a regulatory project to require the appropriate number of fire suits and air packs, and crew training in their use, for new and existing uninspected towing vessels.

Action: We concur with the intent of this recommendation. After consulting with the Towing Safety Advisory Committee, the Coast Guard published a Notice of Proposed Rulemaking (NPRM) entitled "Towing Vessel Safety" on October 6, 1997. The NPRM proposed a combination of fire protection measures, but did not propose to require fireman's outfits or self-contained breathing apparatus. The NPRM was intended to address the human element, recognizing that proper preparation and response by vessel crew is as important as requiring the installation of additional equipment on the vessel. Considering towing vessel characteristics, methods of operation, and service, and the initial and recurrent training required to maintain proficiency in the use of this equipment, we concluded that the NPRM should not propose to require this equipment. Rather, the NPRM proposed crew training, both ashore and afloat, and muster lists to identify and practice crew fire fighting roles before a fire emergency. However, when a towing vessel is equipped with fireman's outfits and self-contained breathing apparatus, drills and training in their use would be required. The Coast Guard is presently evaluating all of the comments received and may change the proposed rules or propose additional rules as a result of those comments.

Recommendation 7: That Commandant (G-M) consider recommending a legislative project to require Coast Guard inspection of all towing vessels towing bulk hazardous liquid barges, to equal current standards for bulk hazardous liquid ships which pose similar risks to the environment. Annual Coast Guard inspection will ensure required equipment is on board and operational, and that crews are adequately trained in fire fighting, lifesaving and abandon ship equipment and procedures.

Action: We do not concur with this recommendation. The Coast Guard considered the issue of towing vessel inspection during the Towing Vessel Inspection Study (1994), conducted in consultation with the Towing Safety Advisory Committee. This study concluded that the majority of personnel and vessel casualties involving uninspected towing vessels were attributable to human factors and that a Coast Guard inspection program was not justified.

Recommendation 8: That Commandant (G-M) consider undertaking a regulatory project to require masters of towing vessels engaged in towing barges containing oil or other liquid hazardous materials to develop a comprehensive voyage plan for each voyage to include specific information related to weather, vessel equipment, communications and navigation as recommended in the North East Regional Risk Assessment Team report.

Action: We concur with the intent of this recommendation. The Towing Safety Advisory Committee recommended that the Coast Guard provide guidance in the area of voyage planning through the development of a Navigation and Vessel Inspection Circular (NVIC) instead of a regulatory requirement. In a Notice of Proposed Rulemaking (NPRM) entitled "Towing Vessel Safety" published on October 6, 1997, the Coast Guard requested public comments on principles of voyage planning for the development of this NVIC. The Coast Guard is presently evaluating


all of the comments received and may change the proposed rules or propose additional rules as a result of those comments.

Recommendation 9: That Commandant (G-M) consider undertaking a regulatory project to require the placement of hand held VHF radios in abandon ship kits for new and existing uninspected towing vessels. Regulations should include minimum training requirements necessary to ensure abandon ship kits are properly used in an actual emergency.

Action: We do not concur with this recommendation. The Coast Guard does not presently have statutory authority to require the placement of hand held VHF radios on uninspected vessels. Further, Executive Order 12866 of September 30, 1993 – Regulatory Planning and Review - requires federal agencies to identify and assess available alternatives to direct regulation whenever practicable. The American Waterways Operators Responsible Carrier Program includes recommendations on lifesaving and communications equipment for uninspected towing vessels.

Recommendation 10: That Commandant (G-M) consider undertaking a regulatory project to develop minimum standards for placement, maintenance and operation of anchors and windlasses on board all new and existing unmanned tank barges.

Action: We concur with the intent of this recommendation. After consulting with the Towing Safety Advisory Committee, the Coast Guard published a Notice of Proposed Rulemaking (NPRM) entitled "Towing Vessel Safety" on October 6, 1997. The NPRM proposed that tank barges and/or towing vessels must: 1) have on board a crew member and an operable anchor that together can stop the tank barge; 2) have an emergency system that will allow the tank barge to be retrieved by the towing vessel if the tow line ruptures; or if neither of these two measures are viable, 3) have another measure or combination of measures onboard comparable to the first two. The Coast Guard considered a Towing Safety Advisory Committee recommendation that an operable anchor be considered as a viable safety option for an unmanned barge. The Coast Guard believes that requiring an anchor on an unmanned barge encourages attempted placement of mariners onto the barge in an emergency situation, and presents an unacceptable risk. The Coast Guard is presently evaluating all of the comments received and may change the proposed rules or propose additional rules as a result of those comments.



T. H. GILMOUR
by Direction

16732

APR 14 1998

SECOND ENDORSEMENT on MSO Providence casualty investigation 16732/MC96000914 of
27 January 1998

From: Commander, First Coast Guard District (m)
To: Commandant (G-MOA)

Subj: INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE FIRE AND
GROUNDING OF THE TUGBOAT SCANDIA, O.N. D517785, AND GROUNDING
OF THE TANK BARGE NORTH CAPE, O.N. D591040, OFF POINT JUDITH,
RHODE ISLAND, ON JANUARY 19, 1996, WITH MAJOR POLLUTION AND NO
PERSONNEL INJURIES OR LOSS OF LIFE

1. Forwarded. Recommendations (1) through (7) , (9) and (10) require action by Commandant.
2. I concur with recommendation (8) which would require preparation of a comprehensive voyage plan for tugs towing tank barges.
3. Recommendation (11) is currently under investigation by MSO Providence.
4. Recommendation (12) is complete and no further action is necessary.


T. M. DALEY

16732/MC96000914
MAR 12 1998

FIRST ENDORSEMENT on MSO Providence casualty investigation
16732/MC96000914 of 27 January 1998.

From: Officer in Charge, Marine Inspection, MSO Providence, RI
To: Commandant (G-MOA)
Via: Commander, First Coast Guard District (m)

Subj: INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE FIRE
AND GROUNDING OF THE TUGBOAT SCANDIA, O.N. D517785, AND
GROUNDING OF THE TANK BARGE NORTH CAPE, O.N. D591040, OFF
POINT JUDITH, RHODE ISLAND, ON JANUARY 19, 1996, WITH
MAJOR POLLUTION AND NO PERSONNEL INJURIES OR LOSS OF LIFE.

1. Forwarded approved, subject to the following comments:

a. Recommendations 1 through 6 and 8 through 10 suggest specific regulatory changes intended to prevent this particular type of casualty from reoccurring. I concur with their intent in principle, however, they reflect a more urgent need for comprehensive safety and engineering standards to prevent loss of propulsion and loss of steering casualties on uninspected towing vessels. I recommend that the Coast Guard in partnership with the American Waterways Operators (AWO) and other towing vessel operators consider establishing a comprehensive baseline set of industry accepted safety and engineering standards focused on eliminating and mitigating the effects of loss of propulsion and loss of steering casualties on towing vessels. Once they are established, I further recommend that the Coast Guard consider "incorporating by reference" these industry standards into regulation to allow for their enforcement.

b. I concur with recommendation 7 in part. While I agree that comprehensive standards are necessary, I do not believe that Coast Guard inspection and certification are necessary to ensure an adequate level of safety. Compliance of the standards would be gained through inspection by third parties, self-inspection or through a combination of voluntary and random examinations by the Coast Guard.

c. With regard to recommendation 11, further investigation has been initiated into the evidence of negligence and misconduct on the part of the master of MV SCANDIA.

16732/MC96000914

JAN 22 1998

Subj: INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE FIRE AND GROUNDING OF THE TUGBOAT SCANDIA, O.N. D517785, AND GROUNDING OF THE TANK BARGE NORTH CAPE, O.N. D591040, OFF POINT JUDITH, RHODE ISLAND, ON JANUARY 19, 1996, WITH MAJOR POLLUTION AND NO PERSONNEL INJURIES OR LOSS OF LIFE.

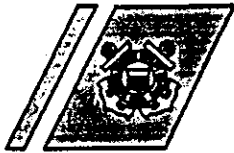
d. With regard to recommendation 12, no further investigation is needed. For their part in the casualty, the operators of MV SCANDIA and TB NORTH CAPE (Eklof Marine Corporation, Thor Towing Corporation, and Odin Marine Corporation) entered guilty pleas in the United States District Court for criminal violation of the Oil Pollution Control Act of 1990, the Refuse Act and Migratory Bird Treaty Act. The Federal court fined the operators \$100,000 for violation of the Oil Pollution Act of 1990, \$400,000 for violation of the Refuse Act, and \$3 million for violation of the Migratory Bird Treaty Act.



PETER A. POPKO

U. S. Department
of Transportation

United States
Coast Guard



Commanding Officer
Marine Safety Office
U. S. Coast Guard

20 Risho Avenue
East Providence, RI
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Phone: (401) 435-2335

16732/MC96000914
27 January 1998

From: LCDR Keith D. WARD, USCG, Investigating Officer
To: Commandant (G-MOA)
Via: Officer in Charge, Marine Inspection, MSO Providence, RI
Commander, First Coast Guard District (m)

Subj: INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE FIRE
AND GROUNDING OF THE TUGBOAT SCANDIA, O.N. D517785, AND
GROUNDING OF THE TANK BARGE NORTH CAPE, O.N. D591040, OFF
POINT JUDITH, RHODE ISLAND, ON JANUARY 19, 1996, WITH
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PRELIMINARY STATEMENT

A routine informal Coast Guard investigation was initiated 19 January 1996, by the Commanding Officer Marine Safety Office Providence, Rhode Island (RI). The Coast Guard and the National Transportation Safety Board (NTSB) agreed that the NTSB would take the overall lead in the investigation under the guidelines of the Coast Guard/NTSB "Memorandum of Understanding Regarding Marine Accident Investigations" dated 28 September 1981. As the investigation was informal, no written convening instructions were issued to either NTSB or Coast Guard investigators.

The NTSB held hearings 22 to 26 January 1996. The NTSB designated the Coast Guard and the tug and barge owner/operator, Eklof Marine Corporation (Eklof), as parties to the investigation. Sworn and transcribed testimony was received during the hearing. Documentary evidence was received before, during, and after the hearings. As the NTSB hearings were informal, documentary evidence was not formally marked and entered into an official record.

The U. S. Attorney for the District of Rhode Island and the RI Attorney General began a criminal investigation soon after the accident. The U. S. Attorney requested that the Coast Guard and NTSB defer completion of their marine casualty investigations until the criminal investigation was concluded. Both agencies agreed to this request.

On 06 October 1997, Eklof Marine Corporation pleaded guilty in State and Federal courts to felony counts of negligently discharging oil in Rhode Island waters and the navigable waters of the United States. The former President of Eklof and the master of the tug SCANDIA also individually pleaded guilty to negligence.

This marine casualty investigation report is based upon information gathered during the initial NTSB and Coast Guard investigations on scene and during NTSB hearings and on information gathered by investigators for the U. S. Attorney and included in the plea agreements.

AUTHORITY

This casualty involved a fire aboard a United States documented, uninspected towing vessel within the Territorial Waters of the United States, and the grounding of the towing vessel and the U. S. documented, Coast Guard inspected tank barge. The casualties were thus investigated by the Coast Guard under 46 United States Code, Section 6301.

FINDINGS OF FACT

I SUMMARY

On 19 January 1996, during an accurately forecast severe winter storm, the Tug SCANDIA experienced an engine room fire while towing the loaded unmanned tank barge NORTH CAPE approximately four nautical miles south of Point Judith, RI. Due to the heat and smoke of the fire and a lack of fire fighting suits and self contained breathing apparatus (SCBAs), the crewmembers were unable to enter the engine room to activate the fire pump or use the semi-portable CO₂ hose-reel fire extinguishing system. Additionally, they were unable to secure mechanical and natural ventilation to the space, and were unable to extinguish the fire with the portable fire extinguishers that were the only other fire fighting equipment available to them. As allowed by the regulations for uninspected towing vessels, the tug was not equipped with a fixed fire fighting system, automatic or remotely operated vent dampers, remote operation of the fire pump, nor with fire fighting suits. The crewmembers were not able to reach the tug's single liferaft due to heat and smoke, but donned survival suits, and eventually safely abandoned ship and were picked up by a Coast Guard small boat. Two tug crewmembers were put aboard the barge from the Coast Guard boat to attempt to lower the anchor but were unable to do so. The anchor windlass that would have normally been used to hold in place and to lower the anchor had been removed from the barge before this voyage. The two crewmembers were not able to undo the jury rigged lashings. They were thus not able to stop or slow the barge's drift toward shore. The Coast Guard boat was able to remove one crewmember from the NORTH CAPE but the deteriorating visibility and weather conditions and the decreasing proximity of shoal water prohibited picking up the second crewmember. The remaining crewmember was later lifted from the vessel by Coast Guard helicopter.

The reported 20 foot seas and more than 40 knot winds also prevented several commercial tugs in the area from reaching the

scene in time to assist. Both the SCANDIA and the NORTH CAPE eventually grounded and the barge spilled approximately 828,000 gallons of the approximately 4 million gallons (96,000 barrels) of number 2 heating oil aboard. This resulting spill became the largest spill in Rhode Island history and the second largest ever in New England. Coast Guard and NTSB investigators, with the assistance of representatives of several federal agencies with forensic fire investigation expertise, were unable to determine the cause of the fire.

II CHRONOLOGY OF EVENTS

Beginning early 18 January 1996 the National Weather Service began broadcasting a forecast of severe winter weather for the New York/New England area for 19 January. At 1745, 18 January (all times are approximate and are in Eastern Standard Time) the Tug SCANDIA with the tank barge NORTH CAPE in tow departed IMTT Terminal at Bayonne, New Jersey enroute to Providence, Rhode Island. The barge was loaded with 96,000 barrels of number 2 heating oil. At approximately 1320 on January 19 a crewmember in the galley first smelled and then saw smoke coming through a space over the door to the "fidley" or upper engine room. At approximately the same time alarms sounded on the bridge monitor of the vessel's comprehensive monitoring system and in the engineer's stateroom. The engineer in his stateroom also heard a loud "boom" and smelled electrical smoke. The chief mate on the bridge acknowledged the alarm by pushing the fire alarm selector button on the monitor. The monitor then indicated "fire in the upper engine room." The chief mate then sounded the general alarm for fire. The Chief Engineer and the Dayman opened the fidley door and unsuccessfully attempted to combat the fire with portable CO₂ fire extinguishers while a tankerman unsuccessfully attempted to secure all outside hatches and doors to the fidley. At 1357 the Master reported the fire to Coast Guard Group Woods Hole by VHF channel 16, in position 41-18N, 071-32W, four nautical miles south of Point Judith, RI. With fire fighting efforts with portable extinguishers having failed, the crew was also unable to reach the CO₂ hose reel and the fire pump controls through the burning fidley. Attempts to reach the liferaft failed and the Master ordered the crew to the bow of the tug with individual survival suits. At 1403 the Master reported to Coast Guard Group Woods Hole that all 6 people on board were abandoning ship. In fact, the crew of 6 was able to remain on the bow until help arrived. Small boats from Coast Guard Stations Point Judith and Castle Hill and a Coast Guard Helicopter from Air Station Cape Cod were dispatched. The F/V SEAFARER was in the vicinity, heard the distress call and headed for the SCANDIA's reported position. The SEAFARER arrived on scene at 1430 but was unable to communicate with the tug's crew and was unable to safely approach the tug to offload the crew in the heavy seas. The SEAFARER deployed their own liferaft near the SCANDIA but the tug's crewmembers chose to stay with their vessel. At 1425 the Coast Guard Cutter Point Turner, in "Bravo 2" (B-2) two hour response status at her regular berth in Newport, RI, was ordered

to recall her crew and get underway as soon as possible. At 1510 the Eklof hired, 3,000 horse power tug CATHERINE out of New London, CT got underway en route the stricken vessels. At 1525 the POINT TURNER got underway.

Battling the high winds and seas, the Coast Guard small boat CG44352 from Coast Guard Station Point Judith arrived on scene at 1455 and observed the 6 crewmembers on board on the bow of the tug. The CG44352 managed to approach the bow of the tug and one person, the Chief Engineer, was able to jump down onto the deck of the boat. At 1509 an explosion occurred on the tug and the 5 remaining people on board jumped overboard. The CG44352 placed a swimmer in the water with swim fins and a retrieval line who retrieved all people from the water. The tug house was completely engulfed in flames. The CG44352 returned to Station Point Judith to treat the swimmer for hypothermia.

At 1540 a recall of the crew of the Coast Guard Cutter Bittersweet, in B-2 status in Woods Hole, MA, began. At 1610 the tug MORGAN BOUCHARD got underway from Providence, RI at the request of the Coast Guard Captain of the Port. After responding to the SCANDIA's distress call, the 65 foot, 760 horsepower small harbor tug CAPTAIN TOM, out of nearby Point Judith, RI, arrived on scene at 1625. The master reported that he was too small to tow the NORTH CAPE but that he would try to assess whether he could safely check the NORTH CAPE's drift towards shore. The CAPTAIN TOM eventually concluded that the conditions made this too dangerous and the vessel returned to Point Judith. At 1638 the Navy reported having no tugs in the area to assist. At 1703 the Coast Guard Cutter POINT TURNER was ordered to seek shelter in Point Judith harbor after suffering damage from pitching in the steep seas.

At 1625 the CG44352 had returned to the scene and at 1656 transferred the Chief Mate and Chief Engineer of the SCANDIA onto the NORTH CAPE to attempt to set the anchor. Weather conditions worsened and the two crewmen were unable to set the anchor, which had been temporarily made fast to the anchor sled with line and wire rope. The windlass, that the anchor chain and wire rope was normally attached to, had been taken off the barge for repairs to the gearing. The attempt to lower the NORTH CAPE's anchor occurred during the peak of the storm, with waves washing over the bow where the chief mate and chief engineer were trying to free the anchor. The rough seas encountered by the barge NORTH CAPE while drifting prior to the attempt to lower the anchor had apparently lifted the chain towing bridle up and on top of the anchor flukes. This greatly increased the tension on the anchor's securing wire rope, shackle and shackle pin. Due to the difficult sea conditions, the only tool the chief mate and chief engineer had been able to bring aboard was a knife. The two crewmembers were unable to reach additional tools in the deck house aft due to seas that were now washing over the deck of the barge. The chief mate and chief engineer worked for approximately 30 minutes cutting the lines and attempting to undo

the shackle on the wire rope holding the anchor on the sled. After the lines were cut, the wire rope and shackle were under pressure and could not be removed. The crewmembers stated that the tension on the wire rope and shackle, the lack of tools, the waves crashing over the barge and the bulky, three-fingered gloves of the survival suits all contributed to the difficulty in removing the pin from the shackle on the wire rope. At 1735, in the very low visibility and worsening seas, the CG44352 managed to transfer the Chief Engineer back to the small boat as the barge drifted closer to the shore, but had to leave the Chief Mate on the barge. At approximately 1757 the SCANDIA and NORTH CAPE grounded off Moonstone beach in approximate position 41-21.7N and 071-35.0W. The NORTH CAPE was holed in several locations and spilled approximately 828,000 gallons of the 4 million gallon oil cargo. At 1758 the tug MORGAN BOUCHARD which had been heading towards the NORTH CAPE from Providence, RI, reported having to turn back due to the sea state. After its crew had all reported aboard by 1808, the Coast Guard Cutter BITTERSWEET remained at its Woods Hole berth until 2140 until the worst of the storm had subsided. The BITTERSWEET then headed to the Newport, RI, Navy base to pick up pollution response equipment and Coast Guard Strike Force members to begin the pollution response. At 2006 Coast Guard Helicopter CG6017 retrieved the Chief Mate from the NORTH CAPE and transferred him to Providence Airport. At 2059 the SCANDIA was still on fire and it continued to burn into the night. The first vessel potentially capable of towing the NORTH CAPE, the tug CATHERINE, arrived on scene at 2045, almost three hours after the SCANDIA and NORTH CAPE had grounded in the surf.

THE RESPONSE

The Commanding Officer of Coast Guard Marine Safety Office Providence, the pre-designated Federal On Scene Coordinator (FOSC) for the area, quickly established a Unified Command with the State of Rhode Island (Department of Environmental Management representing the Governor) and Eklof Marine Corporation. A forward command post with full communications abilities was soon established near the scene at Galilee, RI. Representatives from the Coast Guard National Strike Force, other Federal and State agencies, and civilian contractors rapidly converged on scene as the oil began impacting local beaches and salt ponds.

The next day, 20 January, after the storm had subsided, booming and skimming operations commenced. With the assistance of members of the Coast Guard's Atlantic Strike Team, the Coast Guard buoy tenders BITTERSWEET and SORREL began skimming operations employing Vessel of Opportunity Skimming Systems (VOSS). They were soon joined by commercial skimming vessels. Coast Guard and contracted commercial vessels and personnel began protective booming and representatives from environmental agencies and volunteers began collecting dead wildlife and assisting injured wildlife. Lightering of the NORTH CAPE also began as the seas subsided and other barges could be brought

alongside the grounded vessel. At the height of the clean up over 700 response personnel were employed on shore and on numerous vessels over the next seven days. The clean up was completed, the Unified Command stood down and the forward command post was disestablished 27 January, eight days after the fire and spill.

After completely lightering the remaining cargo and introducing compressed air into the damaged tanks, the NORTH CAPE was refloated on 26 January and towed to the Naval Education Training Center (NETC), Newport, RI on 27 January for further inspection. The vessel was then towed to New York on 30 January 1996. Employing the salvage crane barge CHESAPEAKE 1000, the SCANDIA was eventually extracted from the many tons of sand that the storm had deposited around her hull and refloated on 12 February. The SCANDIA was also transferred to NETC Newport for inspection and then was towed to New York on 15 February 1996.

THE INVESTIGATION

Four NTSB representatives arrived on scene 20 January 1996, met with the Coast Guard investigator, and held informal hearings 22 to 26 January in Narragansett, RI. The NTSB designated the Coast Guard and Eklof Marine Corporation, as parties to the investigation. The Coast Guard investigator and an Eklof representative were thus able to participate in questioning the witnesses.

Beginning on 21 January 1996, and on various dates during the remainder of January and February, investigators from the Coast Guard, National Transportation Safety Board (NTSB), Federal Bureau of Investigations (FBI), Environmental Protection Agency (EPA), Alcohol, Tobacco and Firearms (ATF), U.S. Navy and representatives of the vessel owners boarded the tug and barge to conduct the investigation. The first visits to the vessels were conducted while they were still aground and the tug was in the surf zone with the lower engine room completely flooded from waves entering open weather deck doors. The engine room was later examined while the vessel was afloat at the Naval Education and Training Center (NETC) Newport, RI. The forensic fire investigation was hampered both by the extent of the fire damage and the fact that the interior of the tug had been flooded and subject to violent wave action through open doors and broken portholes for a significant amount of time during the initial storm before investigators could access the vessel. Even very heavy pieces of equipment in the fidly were found several feet from where they had originally been stowed. Large oxygen and acetylene tanks that had been stowed outside aft of the fidley were found laying on the deck inside the fidley. Anything combustible had been consumed in the fire, and loose spare parts, which were originally stowed in wooden cabinets which had been consumed by the fire, were strewn throughout the engineering spaces. While the investigation revealed evidence of a very hot fire in the fidly, and very little fire damage in the actual

lower engine room, the original source of the fire could not be conclusively determined.

On scene electrical engineering support from other federal agencies found some inappropriate routing of electrical wiring in many areas, where fuses and circuit breakers had been bypassed. A report by these investigators states the electrical harness looked old and deteriorated and may no longer have been rated to carry intended electrical loads.

The U. S. Attorney for the District of Rhode Island and the RI Attorney General began a criminal investigation with the assistance of the Federal Bureau of Investigations (FBI) and the Environmental Protection Agency (EPA). With a criminal investigation in progress it became more difficult for the Coast Guard and NTSB investigators to gather information for this marine casualty investigation. During their criminal investigation the U. S. Attorney's office was unable to provide information they had gathered to the Coast Guard and NTSB due to Grand Jury secrecy rules. The U. S. Attorney requested that the Coast Guard and NTSB defer completion of their marine casualty investigations until the criminal investigation was concluded. Both agencies agreed to this request.

On 06 October 1997 the vessels' corporate owners and operator, Eklof Marine Corporation (Eklof) pleaded guilty in State and Federal courts to felony counts of illegally discharging oil in Rhode Island waters and the navigable waters of the United States. The former President of Eklof and the master of the tug SCANDIA also individually pleaded guilty to negligence. These admissions of criminal negligence were based upon the company and the master deciding to use the NORTH CAPE to transport oil without a properly operating anchor and windlass system (although none was required by regulation on the unmanned tank barge NORTH CAPE), on operating the SCANDIA without adequate fire fighting equipment and crew training (although these met the minimum standards required by Coast Guard regulations for an uninspected towing vessel), on an admission of inadequate maintenance of the vessel, and on the decision to continue to operate the SCANDIA and the NORTH CAPE in the face of severe weather warnings. On 09 January 1998 Eklof was fined a total of \$7 million dollars in Federal and State court. During a three year probationary period the company agreed to install additional fire fighting equipment on its vessels, to train its crews in fire fighting techniques, and to refrain from operating unmanned, single-hulled barges in Rhode Island waters. If these conditions are not met the company agrees to pay an additional \$1 million fine. The company also agreed to pay \$1.5 million to a national environmental group for local land preservation. The former Eklof President was sentenced to 3 years probation and a \$100,000 fine, and the SCANDIA master to 2 years probation and a \$10,000 fine.

III VESSEL DATA

Name:	NORTH CAPE	SCANDIA
New name (Oct 96):	WITTE 107	FOURNIER GIRLS
Official Number:	D591040	D517785
ABS Number:	BG-7805271-2	6900783
Lloyd's Number:	N/A	6921359
Service:	Tank Barge	Towing Vessel
Call Sign:	N/A	WBF9529
Gross Tons:	5506 tons	198 tons
Net tons:	5506 tons	135 tons
Registered Length:	323.75 feet	115.2 feet
Length Overall:	340.00 feet	120 feet
Beam:	70.0 feet	30.0 feet
Depth:	27.5 feet	10.5 feet
Propulsion:	N/A	GM 645 diesel engine
Horsepower:	N/A	3600
Home Port:	New York, NY	New York, NY
Owner:	Odin Marine Corp. C/O Eklof Marine 3245 Richmond Terrace P. O. Box 030316 Staten Island, NY 10303-0003	Thor Towing Corp. C/O Eklof Marine 3245 Richmond Terrace P. O. Box 030316 Staten Island, NY 10303-0003
Operator:	Eklof Marine Corp. C/O Eklof Marine 3245 Richmond Terrace P. O. Box 030316 Staten Island, NY 10303-0003	SAME
Master:	N/A	Gregory Aitken
License:	N/A	Mate 500 GT, Near Coastal, #589989
Crew:	Unmanned	6
Keel Laying:	1978	1968
Build Date:	1 JUL 78	1968
Builder:	Zigler Shipyards Inc.	St. Louis Ship
Draft prior to casualty:	23.5 feet forward 25.0 feet aft	16 feet forward 18 feet aft
Marine Document:	Issued New York, NY on 27 DEC 94	Issued New York, NY on 06 AUG 90

Coast Guard Certificate of Inspection (COI) data NORTH CAPE

Biennial Inspection: 08 DEC 95

Expiration Date: 08 DEC 97
Inspection Zone: New York, NY
Cargo: Grade A (up to 25 PSIA REID) and lower.
Capacity: 102,778 Barrels
Route: OCEANS
Drydocked: 02 DEC 94
Inspection Zone: New York, NY
Load Line Issued: 26 JUN 95

IV VESSEL PERSONNEL AND LICENSING INFORMATION

Master SCANDIA: Gregory Aitken
Coast Guard No. 589989; Issue 2-2.
License: Mate near coastal steam and motor vessels of
not more than 500 gross tons.
Issued: 9 APR 93 by Marine Inspection Office New York
(Expires 9 APR 98)

Company Info: Employed by Eklof since May 1988

Training: Ocean Radar
Survival at Sea - Kings Point
Person in Charge (PIC) School - Kings Point
Merchant Marine Academy
MARAD Fire fighting School - New Jersey

Mate SCANDIA: Johnny R. Shelton
Coast Guard No. 771269; Issue No. 3
License: Mate near coastal steam and motor vessels of
not more than 500 gross tons.
Issued: 16 JAN 96 by Marine Safety Office New Orleans
(Expires 16 JAN 01)

Company Info: Employed by Eklof since June 1991

Training: Radar Observer
PIC School
Eklof Respirator Training and Fit Testing

Engineer SCANDIA: William V. Hill, Jr.
Coast Guard No. 765519; Issue No. 2
License: Chief Engineer (limited oceans) of motor
vessels of any horsepower.
Issued: 30 OCT 95 by Marine Safety Office Miami
(Expires 30 OCT 00)

Company Info: Employed by Eklof since November 1995

Training: Advanced & Basic Fire fighting-Sea School
Advanced and Basic CPR

PIC School
HAZWOPER
Eklof Respirator Training and Fit
Certified diesel mechanic
Cold Water Survival - Anchorage, Alaska

Tankerman
Barge Captain
U.S. Merchant
Mariners Doc:

John Cook, Jr.

No. 449315536
Able Seaman-Limited, Tankerman Grade B and
lower grades, wiper, steward's department (FH).
24 SEP 82 by Marine Safety Office Miami
(Expires 24 SEP 97)

Issued:

Company Info:

Employed by Eklof since April 1988

Other Training:

PIC School - Kings Point
Eklof Respirator Training and Fit Testing

Tankerman
Barge Mate
U.S. Merchant
Mariners Doc:

Adrian Conroy

No. 081501017D1
Able Seaman-Limited, Tankerman Grade B and
lower grades, wiper, steward's department (FH).
21 DEC 93 by Marine Safety Office New York
(Expires 21 DEC 98)

Issued:

Company Info:

Employed by Eklof since August 1990.

Other Training:

PIC School - Kings Point
Eklof Respirator Training and Fit Testing

Dayman
Ordinary Seaman
U.S. Merchant
Mariners Doc:

Andrei Parsin

No. 089801494
Able Seaman-any waters, unlimited, wiper,
steward's department (FH).
22 JAN 91 by Marine Safety Office New York
(Expired 22 JAN 96)

Issued:

Company Info:

Employed by Eklof since December 1995

Training:

Third Mate on Russian Trawler for five years
Second Mate on Russian Trawler for 1.5 years
Fire fighting- New York Fire Safety Control
Fire fighting training in Russia

V WEATHER

On 18 January a severe winter storm was forecast by the National Weather Service and commercial services for 19 January for the waters off Rhode Island. At approximately 0306 18 January, more than 34 hours before this casualty and approximately 15 hours before the SCANDIA and NORTH CAPE got underway from IMTT Bayonne, Fleet Weather Service, a private weather information service contracted by Eklof, issued a 24 hour forecast predicting winds increasing to 35 to 45 knots and 12 foot seas off the coast of Rhode Island for the following day. This forecast, which also predicted higher seas on waters exposed to the south, was faxed to Eklof who then faxed it to the Scandia at 1920. At approximately 0250 19 January the Coast Guard issued a Storm Warning for coastal waters within 25 nautical miles of the coast from Watch Hill, RI to Chatham, MA. Predicted winds were from the South to South West at 25 to 35 knots increasing to 45 to 55 knots with higher gusts, and seas building to 15 to 25 feet. As a result of these weather forecasts, by 1200 19 January, all other Eklof vessels that were operating in the areas of New York harbor, Long Island Sound and Rhode Island, with the exception of the SCANDIA and NORTHCAPE, reported to Eklof that they were weatherbound, seeking relief from the storm in harbors of safe refuge.

Actual weather conditions reported by Coast Guard vessels responding to the scene of the casualty were visibility less than 100 yards at times, wind speeds of more than 43 knots from the South West, and more than 20 foot seas. The air temperature was 34 degrees Fahrenheit.

VI GENERAL SCANDIA INFORMATION

The SCANDIA was originally the HELEN McALLISTER until 1983 when Eklof Marine bought the tug "as is" after it had sunk as the result of a collision. Eklof rebuilt the vessel to ABS rules and renamed the vessel. The SCANDIA is a sister vessel to Eklof's THOR which was previously the MARJORIE McALLISTER. After this 19 January 1996 casualty, in October 1996, the SCANDIA was sold and renamed FOURNIER GIRLS. The SCANDIA is a conventional coastal tug, with a small additional hydraulically elevated pilothouse on the port side. The SCANDIA was constructed of all welded steel in 1968. Towing vessels that are under 300 gross tons are not subject to inspection by the United States Coast Guard under 46 United States Code 3301. Uninspected towing vessels are regulated under 46 Code of Federal Regulations (CFR) Subchapter C (Parts 24 through 26). The SCANDIA was built to the American Bureau of Shipping (ABS) Rules for Building and Classing Steel Vessels and was classed by ABS. The most recent ABS survey had been a damage survey and subsequent operational tests of all engine room machinery and electrical equipment after a 5 March 1995 engine room fire. At the completion of the survey the ABS surveyor found the SCANDIA fit for its intended service.

The SCANDIA's previous engine room fire occurred while moored at Northeast Terminal, New Haven, Connecticut. The fire apparently started when a fuel oil line to the water heating system in the lower engine room failed and sprayed fuel oil on a hot surface. After initial investigation, the crew evacuated the engine room, secured all doors, hatches, and ports, and placed mattresses, blankets and pillows over all ventilation openings for the space. The tug CONNECTICUT assisted by providing a fire hose from their fire main and the crew applied water onto the main deck to keep the deck cool. The New Haven Fire Department arrived on scene. Two tug crewman were provided with fire fighting suits and self-contained breathing apparatus (SCBAs) and entered the engine room and evaluated the fire. The crew was able to secure power to the boiler only by entering the engine room using the borrowed fire protection gear and securing the main bus. The fire was then combatted with portable extinguishers and the fire hose and extinguished. Although the fire burned for almost three hours, damage was restricted to the boiler and other electrical circuits and machinery in the immediate area. All repairs were made to the satisfaction of ABS. In a written statement after the fire, the SCANDIA master recommended the tug be outfitted with two air packs, two spare tanks, and two full fire suits. These items were never placed on board so were not on board at the time of the 19 January 1996 fire. This equipment is not required by current Coast Guard regulations aboard uninspected towing vessels.

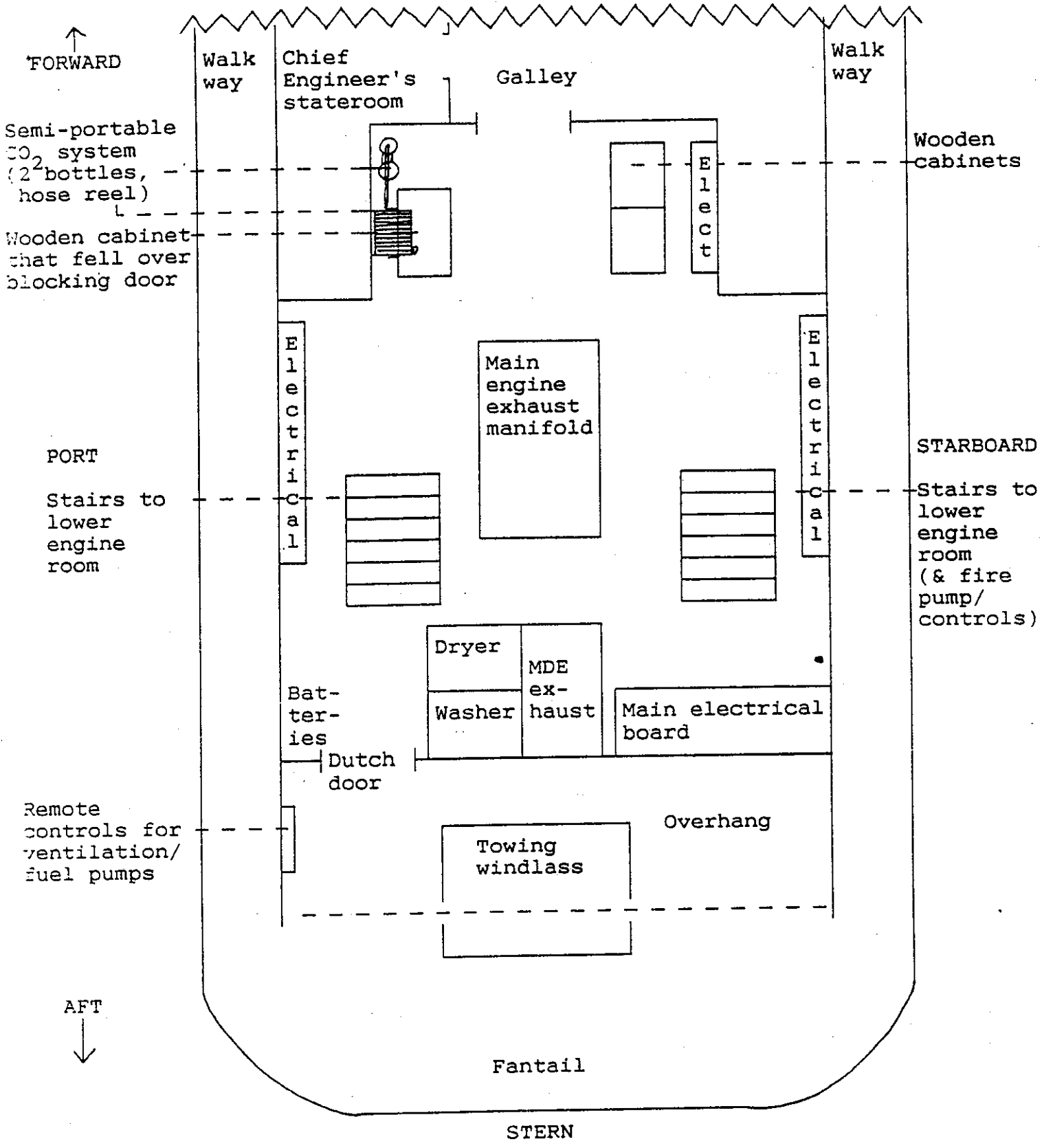
In accordance with 46 CFR 25.30-20(b)(1), minimum fire extinguishing equipment required for an Uninspected Towing Vessel of over 100 gross tons but less than 500 gross tons is three B-II portable extinguishers suitable for extinguishing fires involving flammable liquids, plus an additional B-II for each 1,000 horsepower of the main engines or fraction thereof, not required to exceed a total of six extinguishers. The SCANDIA was therefore required to carry six portable B-II extinguishers. The SCANDIA was equipped with ten portable B-II extinguishers. There are no requirements for smoke detectors, fixed or semi-portable fire extinguishing systems, fire pumps, remote controls for fire pumps when fitted, remote controls for fuel oil pump shutdowns, remotely operated ventilation dampers or ventilation fan shutdowns, fire fighting suits or any type of Self Contained Breathing Apparatus on uninspected towing vessels (less than 300 gross tons). The SCANDIA did have a semi-portable CO₂ system, a locally operated fire pump, remote fuel oil pump shut downs, and remote ventilator fan shutdowns as described below. The SCANDIA also had several independent smoke detectors in the accommodation areas and the comprehensive monitoring system whose heat detector in the upper engine room alerted the crew to the fire. This system also monitored the status of vessel propulsion and generating machinery, fuel systems and bilges and had display screens in the fidley and pilothouse as well as audible alarms in those locations and in the chief engineers stateroom. Heat (fire) sensors were located forward and aft in the engine room overhead and one in the fidley overhead in the approximate center of the space.

The SCANDIA's lower engine room contained the following machinery: a 20 cylinder, 3,600 horsepower exhaust gas turbo charged GM 645 main propulsion diesel engine; two alternating current generators powered by 6 cylinder GM 671 diesel engines; a 2 cylinder GM 271 diesel driven emergency generator; an additional 6 cylinder GM 671 connected to the aft deck towing winch through a chain link transmission; and the above mentioned diesel oil fired boiler for heat and hot water located aft and to starboard. The exhaust for the main propulsion engine ran horizontally approximately 8 inches below the fidley deck grating then up through the center of the fidley into the exhaust stack casing. Exhausts for the other diesel engines also ran through the grating and fidley to the exhaust stack casing. The exhaust piping for the main propulsion engine and the three six cylinder engines were wrapped with overlapping, sectional high temperature thermal insulating blankets. The temperature of the main diesel engine exhaust was reportedly approximately 950 degrees Fahrenheit under normal operating conditions. The temperature of the fidley deck grating was reportedly 135 degrees under the same conditions. Various fuel oil, lubricating oil and hydraulic oil tanks, piping and electric motor driven pumps were also located in the lower engine room. Fuel oil tanks, day tanks and settling tanks were located below and on both sides of the lower engine room. The SCANDIA had left New York with her fuel tanks topped off and had recently filled the day tank before the fire started. Combustible materials such as spray cans of paint and lubricating fluids were stowed in the lower engine room and fidley.

Also in the lower engine room, below the port stairs, was the vessel's two stage, variable discharge fire pump. The pump was driven by a power-take-off (PTO) from the port generator diesel engine just aft. To operate the pump the port generator diesel engine had to be running and the PTO had to be engaged, which could only be done locally in the lower engine room. The inlet, outlet and seachest valves would also have to be manually opened locally. Once the valves were lined up and the PTO was engaged the fire pump provided pressurized sea water to the fire main system. On the starboard side of the engine room was also a ballast pump with a PTO to the starboard generator engine. Its valves could also be lined up to provide sea water to the fire main. Similar controls were also only locally operable. The fire main system had three hydrants on the outside of the vessel, one each on the outside port and starboard bulkheads of the fidley deck, one on the port side of the stack deck, and a fire monitor was located on top of the wheelhouse. Several 1 1/2 inch hoses for the outside hydrants were reportedly stowed in the engine room to keep them from freezing.

The fidley space above the lower engine room was approximately 20 feet long (see following page for diagram of this space). The after 12 foot length was approximately 19 feet wide and the forward 8 foot length was 7 feet wide. The overhead was approximately 9 feet above the grating except immediately below

DIAGRAM OF THE UPPER ENGINE ROOM OR "FIDLEY (not to scale)



the stack opening. Two watertight dutch doors led to the main deck, one aft and one to port. A third non-watertight door led forward to the mess deck and galley. Flammable 1/4 inch sound proofing fiberboard covered the fidley bulkheads and overhead. Fiberglass insulation filled the 3 inch deep, 18 inch wide spaces between the bulkhead frames behind the fiberboard. Two open metal stairways, one port and one starboard, led down to the lower engine room. Two 16 inch portholes were located, one each in the port and starboard fidley bulkheads. Combustion air to the main engine was through an 18 inch diameter steel pipe descending from the air-intake space aft in the exhaust stack casing through the fidley to the turbo charger in the lower engine room. All other diesel engines used ambient air for combustion air. Ventilation for the engine room and fidley included electric exhaust and supply fans in the stack. Other openings to the fidley included gaps above and below the fidley/mess deck door (through which the smoke was first seen coming out of the fidly) as well as numerous non-tight pipe and electrical runs through this same bulkhead. Four foot square louvered exhaust ventilation ducts were on each side of the stack. Each was fitted with a dogged steel door damper. Ventilation supply steel trunks were located at the outboard aft corners of the stack deck. The air intake louvers installed inboard in these trunks had no closing apparatus. The deck grating and stair openings allowed free flow of air between the lower engine room and the fidley above.

Outside of the fidley on a longitudinal bulkhead aft and to port of the aft watertight dutch door was one remote shutoff that closed both port and starboard fuel oil day tank supply valves simultaneously. Next to this shutoff were electric switches for port and starboard ventilation supply fans and the ventilation exhaust fan. Below these were electric switches for the port and starboard fuel oil pumps. In the main deck just aft of this location were four reach rods for the fuel oil storage and transfer tank valves. A T-handle was available to turn the valve stems and close the valves.

The main electrical switchboard with three air circuit breakers was located on the fidley aft bulkhead on the starboard side. The front of the switchboard consisted of five removable steel panels and a breaker switch panel. On the port side aft were three 12 volt batteries, two battery chargers, and a video monitor for the ship's monitoring system including engine functions and alarms, including fire alarms. Against the port bulkhead aft were an electric washing machine and dryer. The automatic shutoff for the clothes dryer in the fidley was not operating properly. The dryer would run continuously until a crewmember manually shut it off. The dryer was reportedly not in use at the time of this fire. On the deck along the starboard bulkhead aft were three electrical transformers and, above them, three rectifiers. Above wooden cabinets against the starboard bulkhead forward were three steel electrical lighting switch boxes. Seven lights with globes and steel cages were installed

in the overhead. Emergency batteries were located in a room forward on the stack deck below the pilothouse.

There was an unlocated electrical short aboard the SCANDIA. Crew members had repeatedly received electrical shocks for the past several months. This had been reported to Eklof but the source of these electrical shocks had never been found.

A semi-portable CO2 fire fighting system, consisting of two 50 pound cylinders and a hose reel, was installed in the port forward corner of the fidley, just inside the fidley/mess deck door. Control valves for the system were on top of the cylinders. No remote operation of the system was installed. Three wooden storage cabinets filled with spare diesel engine parts (some of them oiled or packed in grease) were located forward, two against the starboard bulkhead and one against the port bulkhead aft of the CO2 cylinders and under the hose reel. Oily rags and gloves were stored in a plastic wooden crate on top of one of these cabinets.

All accommodation space bulkheads and overhead were covered with flammable sheathing materials such as marinite and wood panelling. The galley chairs and other furnishings also contained flammable materials. An electric range and oven with ventilator hood was installed forward of the galley/fidley bulkhead.

A paint locker was attached to the stack deck on the starboard side. The locker contained approximately 25 gallon cans of paint and had a small fixed fire extinguishing system.

An inflatable liferaft was installed on the exterior stack deck on the starboard side.

Company records show that some type of drill, usually fire or abandon ship, was performed approximately once a month during crew changes. Captain Aitken stated he personally held fire drills usually once during each two week crew cycle. Drills usually consisted of charging the fire main and laying out hoses.

DAMAGE DESCRIPTION

All combustible materials in the fidley (as well as all other compartments on the main deck, stack deck and bridge deck) were completely consumed by the fire. The fidley/mess deck door was off its hinges, laying inside the fidley. Three expended portable fire extinguishers were also on the deck grating just inside the doorway. Spare diesel engine parts that had reportedly been stored in the three wooden cabinets were scattered over the deck grating throughout the fidley, several inches deep in places. All above showed considerable fire damage. The soundproofing fiberboard bulkhead and overhead covering had been completely consumed. Glass globes around light fixtures on the centerline were found melted and deformed. The

remains of cable armor and insulation on electrical wiring crumbled when disturbed.

During salvage operations, after tightening the propeller shaft stuffing box and the rudder post packing gland, salvors were able to pump all of the SCANDIA's compartments dry except the #8 port and starboard ballast tanks. A divers survey was conducted once the vessel was refloated which confirmed that damage was limited to these tanks. The damage consisted of 5 inch wide by 2 feet long indents and tears in each tank. Most, if not all, of this damage was apparently caused by the lifting slings while trying to lift the Scandia out of the sand.

Once the SCANDIA had been dewatered and refloated, the lower engine room was examined and found to be free of fire damage. Paint on bulkheads and machinery and other combustible materials were intact. A wooden workbench and plastic gauges and switches showed no sign of flame or heat damage. The crew reported that the tug's exterior lights were still on as they waited on the bow to be rescued and as the fire spread to the rest of the tug. The main diesel engine and starboard generator were still working when the vessel was abandoned. There was no evidence of a crankcase explosion.

VII GENERAL NORTH CAPE INFORMATION

The NORTH CAPE was a conventional unmanned, single skinned, non-self propelled tank barge constructed of all welded steel in 1978. As the vessel carried oil in bulk the barge was a "tank vessel" under 46 United States Code 2101 (39) and was subject to inspection as a tank vessel under 46 United States Code 3301 and 46 Code of Federal Regulations (CFR) Subchapter D (Parts 30 through 39). The NORTH CAPE was the holder of a valid Coast Guard Certificate of Inspection as a tank barge. The most recent annual inspection for Certification had been conducted 08 December 1995, approximately 6 weeks before the grounding.

The NORTH CAPE was built to the American Bureau of Shipping (ABS) Rules for Building and Classing Steel Vessels, was classed by ABS, and held a valid ABS issued load line certificate. In December 1994 the vessel was dry docked, and an ABS surveyor conducted a hull exam, load line inspection and intermediate survey. Full hull gaugings were done at that time and the condition of the plating was found to be satisfactory. At the completion of these surveys the vessel was found fit for its intended service.

The NORTH CAPE had a forepeak, seven pairs of cargo tanks, and an afterpeak. Cargo tanks 2 through 6 port and starboard held approximately 9,300 barrels of cargo each. 1 and 7 port and starboard were located above the forward and aft rakes respectively and each held 1,800 barrels of cargo. On deck were two cargo pump houses aft above the #7 port and starboard cargo

tanks, and another single cargo pump house forward above the #2 starboard cargo tank. Each contained a diesel driven cargo pump. A small midships house held tools and paperwork.

Though not required, the NORTH CAPE did have an approximately 6,000 pound anchor on board. However, the windlass for lowering and raising the anchor had been removed for repairs to the windlass gearing prior to departing Bayonne. The anchor was located, as designed, on the bow on a sled protruding out over the water. Normally the anchor would have been held in place by the anchor chain and wire rope being attached to the windlass, by which it would also have been raised and lowered. However, as a temporary measure, while the windlass was off the vessel, the anchor had been attached to the sled by one length of wire rope wrapped around the anchor stock and the sled frame and secured with a shackle, and by lengths of line around the anchor flukes and the sled. The anchor thus could not be lowered in a controlled manner but only by unshackling the wire rope and then cutting the line resulting in an uncontrolled dropping of the anchor. Once lowered, there was no means available on the barge to retrieve the anchor. Attached to the anchor were approximately 22 feet of 2 1/2 inch stud link chain with two shackles and a Crosby swivel. The total length of this hardware was approximately 25 feet and this was normally attached to approximately 600 feet of 1 1/2 inch galvanized wire rope on the windlass drum. The anchor was normally stowed, ready to let go, on the bow sled with the wire rope held on the drum by a mechanical friction brake being set. Instead of being attached to the wire rope, the chain was now attached to approximately 600 feet of 6 inch polypropylene line that was faked down on the barge's deck and not attached to the barge. Eklof employees had been instructed to only deploy the anchor in case of an emergency.

DAMAGE DESCRIPTION

When the NORTH CAPE was driven ashore by the currents and wind the flat hull bottom was set up, cracked and torn by the pounding on the bottom from the storm wave action. In all, cargo tanks 2 starboard and 3 through 6 port and starboard were holed. Cargo tanks 1 and 7 port and starboard were above the slope of the forward and stern rakes respectively, and were thus not in contact with the bottom. The bottom of the starboard skeg was pushed up approximately 2 feet, bent outboard, cracked and torn, and separated from the hull. The bottom of the port skeg had several set ups approximately 2 1/2 inches deep but was not cracked, torn or otherwise holed. Set ups of up to 15" deep were found from approximately 20 feet forward of the bottom of the bulkhead between tank pairs 6 and 7 (the bottom of the rake) to 227 feet forward of this point. Numerous cracks and tears were found from approximately 30 feet forward of the bulkhead between tanks 6 and 7 to approximately 157 feet forward of this bulkhead.

In October of 1996 the NORTH CAPE's name was changed to the WITTE 107. In January 1998 it was moved to a facility in Staten Island, NY to be cut up for scrap.

VIII HUMAN FACTORS

Breath analyzer tests to determine the presence of alcohol were given to all six members of the tug crew approximately 8½ hours after the Mayday was reported. The results were all negative. Urine samples for drug testing (specified in 49 CFR Part 40 for marijuana metabolites, cocaine metabolites, opiate metabolites, phencyclidine and amphetamines) were collected 9½ hours after the Mayday was reported. Five samples tested negative, one sample from an unlicensed crewmember tested positive for amphetamines which was determined by the Medical Review Officer to be due to a valid prescription.

The crew, with the exception of the dayman, were standing a six hours on, six hours off watch rotation. All reported receiving sufficient rest in the previous 24 hours.

IX SPECIFIC FINDINGS OF FACT

1. The tug SCANDIA was owned by Eklof Marine Corporation through its affiliated corporation Thor Towing Corporation. The operator of the SCANDIA was Eklof Marine Corporation.
2. The tank barge NORTH CAPE was owned by Eklof Marine Corporation through its affiliated corporation Odin Marine Corporation. The operator of the NORTH CAPE was Eklof Marine Corporation.
3. Gregory R. Aitken was employed by Eklof Marine Corporation as a tug captain and was assigned as master of the tug SCANDIA during the 18 to 19 January 1996 voyage from Bayonne, New Jersey to Rhode Island. Aitken was properly licensed to serve as master of the tug SCANDIA and her tow, the tank barge NORTH CAPE.
4. The tug SCANDIA was not required to be inspected and Certificated by the U.S. Coast Guard in accordance with 46 U. S. Code 3301 and was only required to meet the requirements of 46 Code of Federal Regulations (CFR), Subchapter C. The tug was employed in the movement of the barge NORTH CAPE.
5. The tug SCANDIA was classed by the American Bureau of Shipping (ABS). At the completion of its most recent ABS survey in March 1995 the vessel was found fit for its intended service.
6. The NORTH CAPE was properly inspected and Certificated by the U.S. Coast Guard in accordance with Title 46, Code of Federal Regulations (CFR), Subchapter D. The barge was employed in the delivery of #2 home heating oil from Bayonne NJ to Providence RI.
7. The most recent inspection for Certification for the NORTH CAPE had been conducted by Coast Guard Marine Inspection Office

New York on 08 December 1995, approximately six weeks before the subject casualty occurred.

8. The NORTH CAPE was classed by the American Bureau of Shipping (ABS), and held a valid ABS issued load line certificate. At the completion of its most recent ABS surveys in December 1994 the vessel was found fit for its intended service.

9. The tug was properly manned as required under Title 46, United States Code (USC), Section 8904 requiring towing vessels 26 feet in length or greater to have a licensed operator. Title 46 USC 8104(h) requires that the licensed operator may not work more than 12 hours in a 24 hour period, effectively allowing for a two watch system. The tug had two properly licensed operators on board with route endorsements for the intended voyage. The tug also had two unlicensed tankermen who took part in the watch system as lookouts, as well as an unlicensed "dayman" cook, and a licensed engineer.

10. The tank barge NORTH CAPE was equipped with a 6,000 pound anchor. The barge NORTH CAPE was not required by regulations to have an anchor on board. 46 CFR 32.15-15 requires all tankships and manned tank barges, with certain exceptions due to builders date, to be fitted with anchors, chain and hawsers. This regulation applies to manned tank barges only. Unmanned barges are exempt from the regulation. American Bureau of Shipping (ABS) Rules for Building and Classing Steel Barges, Section 15.7 ("Equipment for Unmanned Barges"), 15.13 ("Anchor Types"), and 15.19 ("Windlass or Winch") indicate that this equipment is not required as a condition of classification on unmanned barges.

11. After the March 1995 engine room fire, fought with borrowed equipment, the previous master recommended the tug be outfitted with two air packs, two spare tanks, and two full fire suits. These items were never placed on board, nor are they required to be on board by regulation.

12. Eklof did not maintain records of the maintenance and repairs it performed on its uninspected towing vessels and had no preventative maintenance program for these vessels.

13. With the exception of the chief engineer, the SCANDIA crewmembers did not know the locations of the fuel and ventilation shutoffs, did not know how to operate the semi-portable CO₂ system, and did not know how to line up the valves and engage the fire pump. The master of the SCANDIA did not know his vessel was equipped with remote fuel shutoffs on the outside bulkhead aft of the fidley. The master knew only that there were local shutoffs somewhere in the engine room. The master also mistakenly thought the SCANDIA was equipped with a fixed CO₂ system with overhead nozzles in the fidley.

14. The automatic shutoff for the clothes dryer in the fidley was not operating properly. The dryer would run continuously

until a crewmember manually shut it off. Crewmembers reported it was not running at the time of this fire.

15. There was an unlocated electrical short aboard the SCANDIA. Crew members had repeatedly received electrical shocks for the past several months. This had been reported to Eklof but the source of these electrical shocks had never been found or repaired.

16. Although not required by regulation for uninspected towing vessels, the SCANDIA was equipped with remote shut downs for fuel oil pumps, fuel tank valves, and supply and exhaust ventilation fans. These controls were located on the outside (weather deck side) of the aft fidley bulkhead.

17. At 1745, January 18, 1996 the Tug SCANDIA with the tank barge NORTH CAPE in tow departed IMTT Terminal at Bayonne, New Jersey enroute to Providence, Rhode Island. The barge was loaded with 96,000 barrels of number 2 heating oil.

18. Weather forecasts for Long Island and Rhode Island Sound for 19 January called for winds increasing from South to South West at 25 to 35 knots to 45 to 55 knots with higher gusts, and seas building to 15 to 25 feet.

19. As a result of the weather forecasts, by 1200 19 January, all other Eklof vessels that were operating in the areas of New York harbor, Long Island Sound and Rhode Island were reported weatherbound, seeking relief from the storm in harbors of safe refuge.

20. Prior to getting underway, the SCANDIA's master had access to accurate weather forecasts of the approaching severe weather. The master of the tug SCANDIA had available to him the same severe weather forecasts that had caused all other Eklof masters to seek safe refuge from the storm for their vessels.

21. Had the SCANDIA and NORTH CAPE sought shelter by anchoring in a safe harbor (vice mooring at a pier), the anchor would not have been retrievable using the equipment aboard the vessels.

22. On January 19, 1996, at about 1320 the SCANDIA with the NORTH CAPE in tow was approximately 4 miles southwest of Point Judith, Rhode Island. At this time the dayman smelled and saw smoke coming from the fidley and fire alarms sounded aboard the SCANDIA on the bridge and in the chief engineer's state room.

23. At the time of the alarm, the chief mate was on watch on the bridge, tankerman Cook was on watch on the bridge, the master was off watch in his stateroom, the chief engineer was off watch in his stateroom, tankerman Conroy was off watch in his stateroom, and the dayman Parsin was performing his regular duties in the galley.

24. At about 1320, the chief mate heard the alarm on the bridge and acknowledged the alarm by pushing the fire alarm selector button on the monitor. The monitor then indicated "fire in the upper engine room." The chief mate then sounded the general alarm for fire.

25. In a very brief time the master arrived on the bridge, assumed the helm, and the chief mate departed below to investigate the alarm as had been his assigned duty during fire drills.

26. At about 1320, the chief engineer heard an alarm in his stateroom. He proceeded to the galley where he met with the dayman. The chief engineer reported seeing light gray and copper brown smoke coming from the fidley. The engineer smelled what he described as an electrical fire which later changed to a smell of burning plastic.

27. The chief engineer opened the door to the fidley space and reported observing flames through the thick smoke in the center and over to the port side. The chief engineer and the dayman proceeded to attempt to combat the fire, expending three portable CO₂ fire extinguishers.

28. During the time the chief engineer was expending the portable fire extinguishers an unsecured wooden storage cabinet in the fidley fell over, blocking the galley fidley door in the open position. The wooden cabinet then caught fire.

29. At about 1335, the chief mate, chief engineer, and tankerman Cook attempted to secure as many doors and hatches to the fidly as possible. Tankerman Cook was not able to secure the outside aft dutch door to the fidly as he was driven back by the heat and smoke. The fidley galley door was not secured due to heat and blockage by the storage cabinet.

30. The stability letter for the tug Scandia issued by the Coast Guard Commandant (G-MS-1) and dated 27 April 88 states: "Main deck hatches and weather doors to the forecastle and machinery spaces shall be kept closed when rough weather or sea conditions exist or are anticipated." Crew testimony indicates that the top half of the fidley aft dutch door was normally left open and was open during this voyage and at the time of the fire. The door was found open by investigators who boarded the tug after the vessel had grounded and the fire had burnt out.

31. The SCANDIA exceeded the minimum requirements for fire extinguishing equipment for uninspected towing vessels under 46 CFR 25.30-20(b)(1). Under this regulation the SCANDIA was only required to carry six B-II portable extinguishers. The SCANDIA actually had ten B-II extinguishers on board as well as the non-required semi-portable B-V CO₂ system in the fidley, several independent smoke detectors in accommodation spaces, and the fire pump, fire main and hydrant system.

32. Crewmembers were unable to reach the semi-portable CO2 system, located just inside the fidley forward by the galley door, due to the heat and smoke of the fire. The system was not designed for remote operation. The system was designed to be operated by pulling a cable locally that opened a valve on the top of the CO2 bottles.

33. 46 CFR, Subchapter C, subpart 25.30-10(c) simply requires semi-portable fire extinguishers that are carried aboard uninspected towing vessels to be fitted with "suitable hose and nozzle or other practical means so that all portions of the space concerned may be covered." There are no requirements for remote operation.

34. Crewmembers were unable to reach the remote fuel and ventilation shutoffs located outside the fidley aft due to the heat and smoke of the fire. Uninspected vessels are not required to have remote controls for these systems.

35. At about 1357, the Master reported the fire to Coast Guard Group Woods Hole by VHF radio. The location of the vessel was reported as four to five miles off Point Judith.

36. The tug SCANDIA exceeded minimum requirements for lifesaving equipment required for uninspected towing vessels having required life preservers and, in addition, non-required survival suits and a non-required liferaft. 46 CFR Subchapter C, Uninspected Vessels, Subpart 25.25-5(c) requires commercial vessels over 40 feet to have aboard a minimum of one Coast Guard approved life preserver for each person on board. 46 CFR 25.25-5(e) allows approved exposure suits to be substituted for life preservers. 46 CFR 25.25-5(d) requires vessels of 26 feet or more to carry at least one approved ring life buoy. Subchapter C has no requirements for liferafts or other primary life saving equipment.

37. The master instructed the crew to get their survival suits and assemble at the bow in preparation to abandon ship. The crew had been unable to reach the vessel's liferaft, stowed on the starboard side of the stack deck, due to the heat and smoke of the fire.

38. At about 1403, the Master reported to Coast Guard Group Woods Hole that six people on board were abandoning ship. In fact the crew was able to remain on the bow until the Coast Guard small boat arrived.

39. The tug was left on auto pilot at dead slow ahead on its original approximately easterly heading, parallel to the shore.

40. At about 1404, having overheard radio traffic, the F/V NAUTILUS reported being three nautical miles from the Tug SCANDIA by radar observation.

41. At about 1406, having overheard radio traffic, the F/V SEAFARER reported being one nautical mile from the Tug SCANDIA and having radar but not visual contact of the SCANDIA.

42. At about 1430 the F/V SEAFARER reported having visual contact of the SCANDIA and her position to be 41-18-42N and 71-32-05W.

43. At some time during the approximately 45 minutes that the crewmembers were mustered on the bow of the SCANDIA the vessel's deck lights went out. The main diesel engine and starboard generator were still working when the vessel was abandoned.

44. At about 1455 the Coast Guard small boat 44352 from Station Point Judith arrived on scene. The Coast Guard observed smoke and fire coming out the back of the tug. The small boat crew observed that the six tug crewmembers were still mustered on the bow of the tug, wearing their survival suits. The Coast Guard began to attempt to transfer the SCANDIA crew aboard the small boat. One of the SCANDIA crew successfully jumped onto the 44352. The Coast Guard smallboat coxswain decided further such personnel transfers would be too dangerous.

45. At about 1509 the Coast Guard 44352 reported an explosion aboard the SCANDIA. The Coast Guard instructed the remaining crew to jump into the water. The Coast Guard placed a swimmer in the water and retrieved all personnel from the water. The 44352 then proceeded to Station Point Judith to seek medical attention for the hypothermic Coast Guard swimmer.

46. At about 1524 the F/V SEAFARER reported the TUG SCANDIA was engulfed in flames.

47. At about 1535, the Coast Guard 44352 arrived at Coast Guard Station Point Judith. Two Coast Guard crewmen were transported to South County Hospital, South Kingstown, RI, for hypothermia treatment.

48. At about 1600 the Coast Guard 44352 departed Station Point Judith enroute the NORTH CAPE with the Scandia chief mate and chief engineer aboard to attempt to set the NORTH CAPE anchor.

49. At about 1645 the CG 44352 arrived on scene. At about 1656, the CG 44352 transferred the chief mate and chief engineer onto the NORTH CAPE.

50. All attempts to lower the anchor failed.

51. At about 1735, the CG 44352 transferred the chief engineer from the barge onto the small boat. Further attempts to transfer the chief mate were unsuccessful, and the 44352 requested additional Coast Guard assistance.

52. At about 1757 the tank barge NORTH CAPE ran aground in position 41-21.7N and 071-35.0W approximately 100 yards off Moonstone Beach, four miles west of Point Judith, RI. The barge was holed in 2 starboard and 3 through 6 port and starboard cargo tanks as a result of the grounding, spilling approximately 828,000 gallons of oil over the next 3 days.

53. At about 1757, the tug SCANDIA grounded in the surf of Moonstone beach, approximately 100 yards to the northwest of the NORTH CAPE.

54. At about 2006, Coast Guard Helicopter CG6017 retrieved the chief mate from the NORTH CAPE and transferred him to Providence Airport.

55. Due to the severe weather, several local towing vessels were unable to make their way to the stricken vessels until the storm subsided several hours after the groundings. The first vessel potentially capable of assisting and attempting to tow the NORTH CAPE, the tug CATHERINE, arrived on scene at 2045, almost three hours after both the tug SCANDIA and the barge NORTH CAPE had grounded.

CONCLUSIONS

1. The cause of the fire aboard the tug SCANDIA is unknown.
2. The cause of the grounding of the tank barge NORTH CAPE was the disabling fire aboard the towing vessel SCANDIA, which left the tug and barge to drift toward shore with the wind and currents. Contributing to the grounding was the severe weather, which hampered efforts to lower the anchor and to get rescue resources to the scene.
3. The cause of the oil spill was the grounding and holing of the tank barge NORTH CAPE.
4. The fire may have been caused by a malfunction of electrical equipment as the machinery space fire damage was confined to the upper engine room, and just below the upper engine room deck grating, where most of the tug's electrical equipment was located. The chief engineer reported the initial smoke smelled like an electrical fire. Investigators also found some inappropriate routing of electrical wiring where fuses and circuit breakers had been bypassed. An electrical engineering report by investigators from other federal agencies states the SCANDIA's electrical wiring looked old and deteriorated and may no longer have been rated to carry intended electrical loads.
5. The fire did not originate in the lower engine room where the vessel's propulsion machinery, other internal combustion machinery, and the vessel's fuel fired water heater were located. There was no fire damage in the lower engine room except immediately below the fidley deck grating (the lower engine room overhead).
6. There is no relationship between the cause of the SCANDIA fire of 5 March 1995, confined to the water heater in the lower engine room, and the cause of this 19 January 1996 SCANDIA fire that was confined to the upper engine room.
7. By the time the 19 January 1996 SCANDIA fire was detected (by a crewmember in the galley observing smoke coming around the closed galley/fidley door, and by the alarms set off by the activated heat sensor in the upper engine room connected to the vessels comprehensive monitoring system) the fire was too advanced to be fought with the equipment on board. Although sufficient to meet the minimum standards of Coast Guard regulations for uninspected towing vessels (46 CFR 25.30), the fire fighting equipment aboard the tug SCANDIA was insufficient to fight a significant machinery space fire (as was also earlier demonstrated in the March 1995 localized hotel boiler fire fought at the dock with borrowed equipment).
8. The installation of a machinery space smoke detection system with sensors in the fidley and a remote alarm on the bridge would likely have provided earlier warning of the fire.

9. By the time the crewmembers were alerted to the fire by the heat sensor alarms, smoke, heat, and flames had already engulfed the fidley and made access to the space impossible without fire fighting protective equipment. This precluded reaching the fire pump controls in the lower engine room.
10. Having earlier warning of the fire from a smoke detection system would likely have allowed the crew to use the semi-portable CO₂ system, installed just inside the fidley near the galley door.
11. Having earlier warning of the fire from a smoke detection system would likely have allowed the crew to reach the remote controls to shut off fuel to the engines and shut off ventilation to the engine room. The location of these remote controls, just outside the aft fidley door, was too hot and filled with smoke by the time the heat detector alarm alerted the crew to the fire.
12. Having remote fire pump controls in a location away from the machinery spaces would have allowed the crewmembers to use the vessel's fire main and hydrant system. The only access to the existing controls in the lower engine room was by two ladders leading down from the burning fidley.
13. The presence of combustible, inadequately secured wooden cabinets in the fidley contributed to the crew's difficulty in fighting the fire.
14. Combustible materials used in construction of the vessel contributed fuel to the fire.
15. A machinery space fixed fire extinguishing system designed and installed to meet the requirements of 46 CFR 95.15 or 46 CFR 34.15, as would be required if the SCANDIA were a Coast Guard inspected cargo vessel or tank ship, would have aided fire fighting efforts had ventilation sources been secured.
16. Firemen's outfits consisting of protective clothing, self contained breathing apparatus, and other equipment as described in 46 CFR 96.35 for Coast Guard inspected cargo vessels, would have assisted the crew in combating the fire.
17. Had the crew been able to extinguish the fire, it is likely the SCANDIA could have continued to tow the NORTH CAPE, as the main diesel engine and starboard generator continued to run until after the crew abandoned the vessel.
18. Both Coast Guard and private forecasts predicting the severe weather were accurate.
19. Both Eklof and the SCANDIA's master had access to the weather forecasts predicting the severe weather in time to delay the trip or to seek shelter.

20. It is not known whether the NORTH CAPE's anchor, as rigged the day of the casualty with the 600 feet of 6 inch polypropylene line, would have held or slowed the vessel's rate of drift enough to have allowed other towing vessels to reach the NORTH CAPE in time to tow it away from shore.

21. It can be presumed that having a 6,000 pound anchor properly deployed at the end of a significant scope of line of sufficient strength would have slowed the vessel's rate of drift towards shore to some degree. The anchoring attempt began at approximately 1656 and was aborted approximately 40 minutes later, at 1735, due to the barge's and Coast Guard rescue boat's proximity to shoal water and breaking surf. The barge then was reported aground at 1757, one hour after the beginning of the anchoring attempt. The first tug on scene capable of towing the NORTH CAPE was the tug CATHERINE which was reported on scene at 2045, almost three hours after the NORTH CAPE was reported aground. Presumably, the tug CATHERINE would have had to reach the barge and hook up before the NORTH CAPE reached the position where the Coast Guard boat coxswain deemed conditions too dangerous to work alongside the NORTH CAPE due to the proximity of the shore. Using this assumption, had the anchor been dropped almost immediately upon the two crewmembers boarding the barge, it would have had to cut the barge's rate of drift to a maximum of about 20% of its original rate to have allowed the CATHERINE to arrive in time to have hooked up to the NORTH CAPE. Even this estimate assumes the CATHERINE would have been able to hook up almost immediately upon arriving on scene which may not have been possible given the sea conditions and proximity to shoal water and surf.

22. It is not known whether the NORTH CAPE's normal anchor system, which normally had 600 feet of 1 1/2 inch galvanized wire rope in place of the polypropylene line, would have held or slowed the vessel's rate of drift enough to prevent the grounding if properly deployed.

23. The master's failure to adhere to the provisions of the vessel's stability letter, specifically allowing the aft fidley dutch door to remain open, likely contributed to the escalation of the fire.

24. The decision of the master to abandon ship appropriately placed personnel safety over further fire fighting efforts given the fire fighting equipment available aboard the vessel. His orders to the crew to get their survival suits, leave all possessions behind, and muster on the bow of the tug were instrumental in preventing any injuries or loss of life. Keeping the crew together and staying on the tug as long as possible also contributed to the crew's safe rescue.

25. The crew having a handheld radio when mustered on the bow would have aided communications and assisted rescue efforts.

26. There is evidence of negligence on the part of the master of the SCANDIA for towing the NORTH CAPE loaded with oil on 19 January 1996 given the predicted severe winter storm and the removal of the anchor windlass from the barge.

27. There is evidence of negligence on the part of the operators of the SCANDIA and NORTH CAPE in allowing the SCANDIA to tow the NORTH CAPE loaded with oil on 19 January 1996 given the predicted severe winter storm and the removal of the anchor windlass from the barge.

28. There is evidence of negligence or misconduct on the part of the master of the SCANDIA in allowing the SCANDIA to be operated not in compliance with the vessel's stability letter, i.e. having the aft fidley door open "when rough weather or sea conditions exist or are anticipated."

RECOMMENDATIONS

1. That Commandant (G-M) consider undertaking a regulatory project to require fixed fire fighting and ventilation control systems for machinery spaces on new and existing uninspected towing vessels.
2. That Commandant (G-M) consider undertaking a regulatory project to limit the use of combustible materials in the construction and outfitting of new uninspected towing vessels.
3. That Commandant (G-M) consider undertaking a regulatory project to limit the use of combustible materials in the outfitting of existing uninspected towing vessels.
4. That Commandant (G-M) consider undertaking a regulatory project to require smoke detection systems with remote alarms for all machinery and accommodation spaces on new and existing uninspected towing vessels.
5. That Commandant (G-M) consider undertaking a regulatory project to require independently driven fire pumps, remotely operable from outside of machinery spaces, on new and existing uninspected towing vessels.
6. That Commandant (G-M) consider undertaking a regulatory project to require the appropriate number of fire suits and air packs, and crew training in their use, for new and existing uninspected towing vessels.
7. That Commandant (G-M) consider recommending a legislative project to require Coast Guard inspection of all towing vessels towing bulk hazardous liquid barges, to equal current standards for bulk hazardous liquid ships which pose similar risks to the environment. Annual Coast Guard inspection will ensure required equipment is on board and operational, and that crews are adequately trained in fire fighting, lifesaving and abandon ship equipment and procedures.
8. That Commandant (G-M) consider undertaking a regulatory project to require masters of towing vessels engaged in towing barges containing oil or other liquid hazardous materials to develop a comprehensive voyage plan for each voyage to include specific information related to weather, vessel equipment, communications and navigation as recommended in the North East Regional Risk Assessment Team report.
9. That Commandant (G-M) consider undertaking a regulatory project to require the placement of hand held VHF radios in abandon ship kits for new and existing uninspected towing vessels. Regulations should include minimum training requirements necessary to ensure abandon ship kits are properly used in an actual emergency.

10. That Commandant (G-M) consider undertaking a regulatory project to develop minimum standards for placement, maintenance and operation of anchors and windlasses on board all new and existing unmanned tank barges.

11. That Commanding Officer, Coast Guard Marine Safety Office Providence consider initiating an investigation into evidence of negligence and misconduct on the part of the master of the SCANDIA.

12. That Commanding Officer, Coast Guard Marine Safety Office Providence consider initiating an investigation into evidence of negligence on the part of the operators of the SCANDIA and NORTH CAPE.

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