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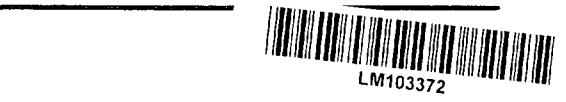
RELEASED

REPORT OF THE COMPTROLLER GENERAL OF THE UNITED STATES



Tankers And Oil Transfer Operations On The Delaware River And Bay

U.S. Coast Guard
Department of Transportation

During calendar years 1973 through 1976, 180 oil tanker pollution incidents and 83 tanker casualties were reported on the Delaware River and Bay. Seven caused a discharge of more than 10,000 gallons of oil. The primary causes of the pollution incidents and the casualties were human error and equipment failure.

While incidents resulting from such causes probably cannot ever be eliminated completely, various actions since January 1977 or currently under consideration should help to reduce the occurence of similar incidents.

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AUGUST 23, 1977

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-146333

The Honorable William V. Roth, Jr.
United States Senate

Dear Senator Roth:

Pursuant to your request of January 5, 1977, we have reviewed the safety of oil shipping and transfer operations on the Delaware River and Bay.

We have incorporated oral comments on the contents of our proposed report from the U.S. Coast Guard and the U.S. Army Corps of Engineers.

As arranged with your office, we plan to send copies to interested parties 2 days after the date of the report, and thereafter to make copies available to others upon request.

Sincerely yours,

Elmer B. Staats

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE HONORABLE
WILLIAM V. ROTH, JR.
UNITED STATES SENATE

TANKERS AND OIL TRANSFER OPERATIONS ON THE DELAWARE RIVER AND BAY

U.S. Coast Guard
Department of Transportation

D I G E S T

The recent accidents in the Delaware River and Bay raised questions regarding operations of oil tankers in those waters. GAO was asked by Senator W. V. Roth, Jr., of Delaware, to determine, among other things, whether

--navigational control systems are adequate,

--channels are clear, and

--tankers are inspected closely enough prior to entry.

GAO concluded that the safety of oil shipping and transfer operations on the Delaware River and Bay, which officials of the U.S. Coast Guard and the Pilots' Association believe to be relatively safe, have not changed materially over the years 1973-76. GAO also concluded that steps taken since January 1977, or currently under consideration should improve the safety of tankers using this area.

More than 4,000 vessels arrive yearly at the ports along the Delaware. About 40 percent are oil tankers. (See p. 2.) From calendar years 1973-76, 180 oil pollution incidents involving tankers were reported. Seven of these resulted in oil spills of more than 10,000 gallons. During the same period there were 83 tankship casualties reported. (See p. 5.)

In most of the cases the Coast Guard investigation attributed the primary cause to human error or equipment failure. (See p. 5.) These are not easily correctable and probably cannot ever be eliminated completely.

Coast Guard programs are designed to protect the environment from oil spills and provide

for the safety of vessels through preventive measures, such as boarding and inspecting a sample of tankers (both U.S. and foreign) entering a port and monitoring a percentage of all liquid bulk transfer operations involving oil or hazardous substances. (See p. 13.) In addition, the Coast Guard performs periodic inspections of the structure, machinery, and equipment of all U.S. ships to determine if they are in satisfactory condition. (See p. 15.)

Since January 1977 the Coast Guard has taken several actions to expand its programs. These include

--inspection of cargo venting and handling systems and proper transfer procedures on all tankers (see p. 16) and

--requirements for navigational and safety equipment and current charts and nautical publications for all tankers (see p. 17).

Other proposals still under consideration would

--increase qualifications for crew members in charge of oil transfer operations on U.S. ships (see p. 14);

--require double bottoms on all new tankers and segregated ballast and inert gas systems on all new and existing tankers (see p. 14);

--improve emergency steering standards for tankers, backup radar systems, and collision avoidance equipment (see p. 14); and

--require cargo monitors (see p. 14).

The Coast Guard is also working to improve international standards in the area of ship inspection, certification, crew qualifications, and equipment standards. (See pp. 22 and 23.)

In addition to these national efforts, locally, the Coast Guard is working to improve the aids to navigation on the Delaware River and Bay (see p. 18) and the Corps of Engineers has recently received approval for a project to

improve one of the anchorages on the river (see p. 19).

Officials of the Coast Guard and the local pilots' association agreed that these actions will help to minimize future pollution incidents and casualties similar to those reviewed. The pilots' association, however, did provide certain suggestions to improve safety of operations on the Delaware River and Bay. (See pp. 22 to 25.)

GAO specifically determined that

--expanded requirements for navigational, steering, and pollution prevention equipment have the potential to reduce the types of incidents examined (see p. 25);

--proposed U.S. regulations and international efforts to improve standards should also help reduce incidents (see p. 25);

--maintenance of the channel and the navigational system currently in operation appear adequate while improvements suggested by the Pilots' Association regarding the aids to navigation and restrictions on the use of anchorages may have the potential to further reduce risks to vessels using the area (see p. 26);

--the project being contemplated by the Coast Guard to establish a secondary channel in the river has merit (see p. 26); and

--the expansion of the inspection program should help improve the safety of tankships (see p. 26).

In view of current operations and recent regulation changes, GAO is making no recommendations with respect to additional safety improvements. (See p. 26.)

Contents

ABBREVIATIONS

COTP	Captain of the Port
GAO	General Accounting Office
IMCO	Inter-Governmental Maritime Consultative Organization
SOLAS 60	International Convention for the Safety of Life at Sea, 1960

CHAPTER 1

INTRODUCTION

Senator William V. Roth, Jr., requested us to review the safety of oil tanker shipping and transfer operations on the Delaware River and Bay because of a concern that major pollution incidents had increased over the past few years. As agreed, we examined in detail a sampling of the records of tankship oil pollution and casualty incidents to determine the nature and cause of the incidents (see ch. 2) and the efforts taken or planned toward improving vessel safety and minimizing pollution problems on the Delaware River and Bay. (See ch. 3.) We also discussed these incidents with knowledgeable maritime officials to determine what actions could be taken to minimize the occurrence of such incidents in the future. (See ch. 4.)

DELAWARE RIVER AND BAY

The Delaware River has played an important role in national growth from the founding of Philadelphia. The ports of the Delaware River have grown until today they lead the United States in total imports and rate second nationally in total waterborne commerce. The river's petroleum imports feed the largest refinery center and associated petrochemical industries on the east coast. Over 9,000 manufacturing plants, representing 90 percent of all types of industry, are located in the area serviced by the ports of the Delaware River. The largest are the oil and steel industries, which are dependent upon deep-draft navigation.

The Delaware River forms the boundary between New Jersey to the east and Pennsylvania and Delaware to the west as it follows its southerly course to the mouth at Delaware Bay. The navigable portion of the Delaware River, for deep-draft vessels, flows nearly 135 miles from the vicinity of Trenton, New Jersey, to the mouth of the Delaware Bay. (See map on page 3.)

In the 1880s the U.S. Army Corps of Engineers began a program to improve the Delaware River's natural 17- to 24-foot depth to accommodate larger sailing vessels. This was the first of a number of channel improvements authorized by the Congress which have resulted in a 40-foot channel from Newbold Island (about 6 miles south of Trenton) to deep water in Delaware Bay, with widths ranging from 400 feet at the upstream end of Newbold Island to 1,200 feet in the bay. The channel has been a crucial ingredient in making the Delaware River and Bay one of the most important commercial waterways in the world.

The movement of waterborne commerce is accomplished by more than 4,000 vessels arriving annually at the ports of the Delaware River. During calendar years 1973-76, the number of vessels transiting the Delaware River and Bay was 5,127, 4,815, 4,638, and 4,453, respectively. Of the total number of vessels transiting the river during this period, 40 percent were oil tankers. Further, about 62 percent of the oil tankers calling on the ports of the Delaware River during calendar year 1976, were of foreign registry.

Although there has been a decrease in the number of vessels transiting the river, the ports of the Delaware River continually support over 130 million tons of waterborne commerce annually. For example, waterborne commerce during calendar years 1973-75 totaled 139,297,118 tons, 143,673,501 tons, and 131,819,164 tons, respectively. Of the total 1975 tonnage, 57,577,652 tons, or 43 percent, was crude oil.

ROLE OF FEDERAL GOVERNMENT

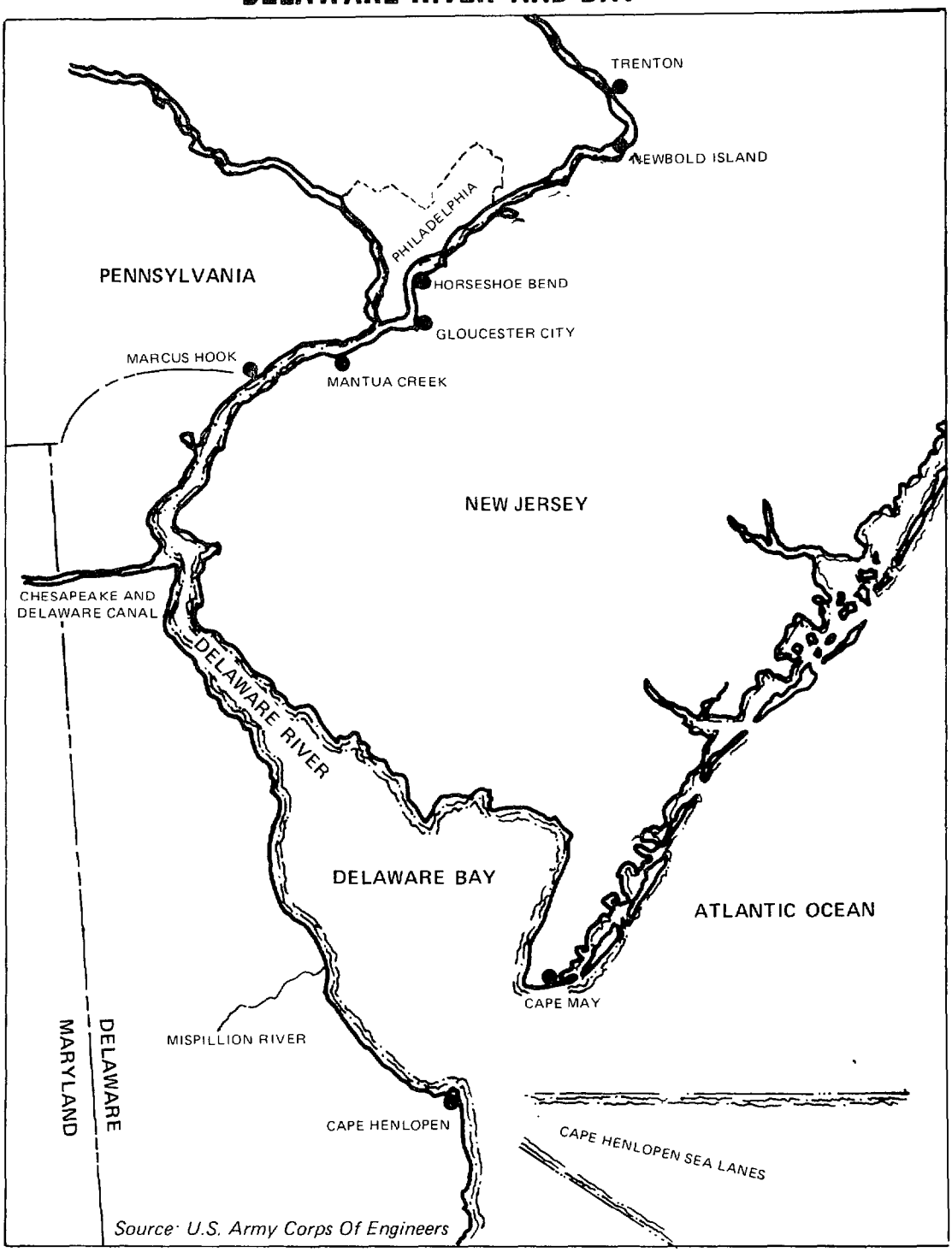
The length and expanse of the Delaware River and Bay and the number of vessels transiting its navigable waterway, make safe merchant marine operations an important matter. The primary Federal agencies involved in marine safety along this waterway are the U.S. Coast Guard and the U.S. Army Corps of Engineers.

U.S. Coast Guard

The Coast Guard is the primary maritime agency empowered to restore and maintain the integrity of the Nation's navigable waters. The Coast Guard Headquarters in Washington, D.C., plans, directs, coordinates, and evaluates programs carried out by the 12 Coast Guard districts. The districts provide regional direction, support, and coordination for functions performed by their field units. The Delaware River and Bay comes under the jurisdiction of the Third District in New York.

The Captain of the Port (COTP) of Philadelphia, the Coast Guard Base at Gloucester City, New Jersey, and the Coast Guard Marine Inspection Office in Philadelphia, Pennsylvania, under the jurisdiction of the Third Coast Guard District, execute and support the Coast Guard's missions, programs, and functions for protecting the marine environment from pollution and preventing marine casulties in the Delaware River and Bay.

DELAWARE RIVER AND BAY



The functions of the COTP include monitoring and supervising oil transfer and hazardous cargo operations, monitoring or cleaning up pollution discharges, conducting harbor patrols, inspecting and surveying waterfront facilities, establishing security zones, and controlling vessel movements and anchorages. All pollution and casualty incidents must be reported to the Coast Guard. The COTP of the Philadelphia also serves as Commanding Officer of the Gloucester City Base.

The Marine Inspection Office's mission is to minimize deaths, personal injuries, and property loss or damage in the marine environment associated with the design, construction, and manning of commercial vessels and with their cargoes. Its functions include such duties as equipment and vessel inspections, onsite casualty and disciplinary investigations, vessel plan review and approval, licensing and certification of U.S. seamen, vessel documentation, and proceedings related to marine casualties.

The Coast Guard bases at Gloucester City and Cape May, New Jersey, and the Coast Guard cutters Red Oak and Sassafras have the responsibility for placement and maintenance of navigational references on the Delaware River and Bay, such as audio, visual, or electronic signals using buoys, lights, and radio beacons. The navigational references are to assist the mariner in determining his position and to warn him of dangers and obstructions so that he may follow a safe course.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers has charge of the improvement of the rivers and harbors of the United States and of miscellaneous other civil works which include the administration of certain Federal laws enacted for the protection and preservation of navigable waters of the United States; the establishment of regulations for the use, administration, and navigation of navigable waters; the establishment of harbor limits; the removal of sunken vessels obstructing or endangering navigation; and the granting of permits for structures or operations in navigable waters, and for discharges and deposits of dredged and fill materials in these waters.

The Philadelphia District of the Corps of Engineers has jurisdiction over the Delaware River and Bay.

CHAPTER 2

TANKER POLLUTION AND CASUALTY INCIDENTS ON THE DELAWARE RIVER AND BAY

A total of 180 reported tanker pollution incidents occurred on the Delaware River and Bay during calendar years 1973-76. However, only 7 of the 180 incidents involved discharges of more than 10,000 gallons of oil or hazardous substance, and the vast majority of the remaining discharges were small. Nine tankers were involved in the seven discharges: three of U.S. registry and six of foreign registry, of which four were Liberian registry. We found no meaningful trends in the number of pollution incidents in the 1973-76 period, however, the tanker spills involving small quantities did decline.

The primary causes of the pollution incidents we examined were human error and equipment failure. In the seven cases where more than 10,000 gallons of oil or hazardous substance was discharged, two were caused by human error, three by equipment failure, and the causes of two are unknown, of which one is still under investigation by the Coast Guard. About two-thirds of the smaller spills were caused by human error.

During calendar years 1973-76 there were 83 reported tanker casualty incidents, involving 90 tankers, on the Delaware River and Bay. Of the 90 tankers, 44 were U.S. flagships and 46 were foreign flagships, of which 27 were Liberian flagships. These casualties involved mostly collisions and groundings. Our sample of the casualties showed that the primary causes of these casualties were human error and equipment failure.

POLLUTION INCIDENTS

A pollution incident is the discharge of a harmful quantity of oil or hazardous substance on the navigable waters or contiguous zone of the United States or adjoining shorelines. Based on Federal regulations the Coast Guard classifies oil or hazardous substance discharges in coastal regions by three categories.

Major spill--a discharge of more than 100,000 gallons of oil or any quantity of material or substance that substantially threatens the public health or welfare, or generates wide public interest.

Medium spill--a discharge of 10,000 to 100,000 gallons of oil or any quantity of any material that poses a threat to the public health or welfare.

Minor spill--a discharge of less than 10,000 gallons of oil or of any quantity of any other material that does not pose a threat to the public health or welfare.

During calendar years 1973-76, the number of oil tankers transiting the Delaware River and bay was 2,115, 2,015, 1,747, and 1,818, respectively. These oil tankers were involved in a total of 180 pollution incidents on the Delaware River and Bay. As shown below, the vast majority of these incidents resulted in small discharges of oil.

	1973	1974	1975	1976	Total
Major	1	2	1	1	5
Medium	0	0	0	2	2
Minor	68	46	31	28	173
Total	69	48	32	31	180

We examined all of the major and medium incidents, but limited our examination of minor incidents to those that occurred in calendar year 1976.

There were nine tankers involved in the five major and two medium pollution incidents: four of Liberian registry, three of U.S. registry, and one each of French and Greek registry as shown in the following table.

Date	Vessel(s)	Flag of registry	Quantity spilled (gallons)	Nature of incident
12/26/73	William L. Mellon	Liberia	126,000	Grounding
2/19/74	Athos	France	285,000	Ramming
	Notre Dame Victory	United States		
4/9/74	Elias	Greece	275,000	Explosion
1/31/75	Corinthos	Liberia	500,000	Ramming
	Edgar M. Queeny	United States	12,000	
3/14/76	Afran Energy	Liberia	22,000	Accidental discharge
4/29/76	Texaco Illinois	United States	84,000	Collision
12/27/76	Olympic Games	Liberia	133,500	Grounding

With the exception of the Edgar M. Queeny and the Texaco Illinois, oil was the pollutant spilled. In these two cases, the pollutant spilled was paraffin and benzine, respectively.

In contrast the total volume of the 28 minor oil spills by tankers that occurred on the Delaware River and Bay during calendar year 1976 was about 3,600 gallons, ranging from 1 pint to 832 gallons. Seventeen of the spills were 100 gallons or less and 9 of these were 5 gallons or less. There were 27 tankers involved in the 28 spills: 11 of Liberian registry; 3 each of the United States, and Norwegian registry; 2 of British registry; and 1 each of Ecuadorian, French, West German, Greek, Italian, Japanese, Panamanian, and Spanish registry.

As shown by the following table, the primary causes of the 35 pollution incidents we examined were human error.

	Cause of pollution			
	Human error	Equipment failure	Other	Unknown
Major	2	2	-	1
Medium		1	-	1
Minor	19	4	3	2
Total	21	7	3	4

The causes and circumstances surrounding the pollution incidents follow.

Human error

The spills involving the tankers William L. Mellon, and the Corinthos and Edgar M. Queeny were both attributed by the Coast Guard to human error.

The William L. Mellon ran aground during its upriver voyage while attempting to avoid a collision with two other vessels. The Coast Guard concluded that the proximate cause of this incident was the failure of the pilot to slow the Mellon down to a more prudent speed after being advised by radio that the vessel ahead of it was intending to anchor. The Coast Guard also concluded that a contributing cause of the incident was the failure of the vessel proceeding downriver to accord privileged vessel status to the Mellon in a tight navigational situation when the Mellon had little recourse or alternative due to its size, depth, and state of the tide.

The Corinthos was berthed and discharging its cargo when it was rammed by the Edgar M. Queeny which was executing a turning maneuver from the opposite side of the river. A Coast Guard Marine Board of Investigation concluded that there was evidence of negligence on the part of the pilot and master of the Edgar M. Queeny and recommended further investigation into their actions during the incident. This investigation was conducted and resulted in suspension and revocation proceedings against the pilot and the master.

Most of the 19 minor pollution incidents were caused by human error, such as a tank overflowing during transfer operations either because the hatch covers or valves were not all properly closed or because the tank was overfilled and the oil escaped through the tank vents. Although several of these discharges resulted in a spill of only a few gallons, prompt corrective action was not taken in some cases because the overflow was not immediately observed. In a few cases, the Coast Guard investigative reports noted that the proper preventative measures had not been taken to contain the oil overflow on deck.

Equipment failure

The spills by the tankers Athos, Texaco Illinois, and the Olympic Games, all occurred because of equipment failures. The tanker Athos was berthed when it was rammed by a passing tanker (Notre Dame Victory) which had a mechanical failure causing loss of steering capability. The tanker Texaco Illinois was struck by a tug assisting it in a docking maneuver. During the maneuver, the tug experienced a mechanical failure which made it incapable of reversing its engines, which were at full astern. Consequently, the vessels collided and the hull of the Texaco Illinois ruptured in the area of a cargo tank. Similarly, the tanker Olympic Games experienced a mechanical failure during a docking maneuver which resulted in a loss of its astern power. As a result, the vessel ran aground and ruptured a cargo tank.

The four minor pollution incidents resulting from equipment failure were caused by broken or malfunctioning valves or loss of suction on cargo pumps.

Unknown

The incident involving the explosion on the Elias, which resulted in a major pollution incident, is still under review by the Marine Board of Investigation. While evidence developed by the Coast Guard indicated that there may have been a fire on board prior to the explosion, the cause has not yet been determined. This incident is also in litigation.

The spill by the tanker Afran Energy occurred because of an accidental discharge while the vessel was moored prior to taking on ballast. This discharge occurred through fittings, located in the ships' hull below the water line, utilized for admitting or discharging water, but the cause could not be determined.

There were two minor pollution incidents where oil was observed near the tankers but the Coast Guard could not determine the cause of the discharge.

Other

The three remaining minor pollution incidents resulted from a leaking rivet on the hull of the ship, a suspected crack or opening in the hull, or leakage of oil into the ballast tanks.

CASUALTY INCIDENTS

A marine casualty includes any occurrence involving a vessel which results in damage by or to the vessel, its apparel, gear, and/or cargo, or injury or loss of life of any of its crew or passengers. Such occurrences include collisions or rammings 1/, groundings, fires, failure of gear and equipment, and any other damage which might affect and/or impair the seaworthiness of the vessel.

During calendar years 1973-76, there were 83 reported tanker casualties, involving 90 tankers, on the Delaware River and Bay; 44 tankers, or 50 percent, were U.S. flagships; and 27 tankers, or 30 percent, were Liberian flagships. Two-thirds of the casualties resulted from collisions or rammings and groundings. We examined some of these casualties, even if they did not result in pollution, because many have a high potential for pollution when they involve a tankship.

We randomly selected 20 tanker casualties for a detailed review which showed that the primary causes of these casualties were human error and equipment failure. A summary of the causes of the 20 casualties is presented below.

1/Collisions--an accident involving two or more moving vessels. Rammings--an accident involving a moving vessel and a stationary object, such as a bridge, pier, or moored vessel. Rammings are sometimes referred to or classified as collisions.

Primary cause of casualty	Number of casualties
Human error	7
Equipment failure	7
Unknown	2
Other	4

Of the 20 casualties 1 resulted in a major oil pollution incident and 3 others resulted in minor pollution incidents. There is no evidence of pollution in the other 16 casualties we reviewed.

The causes and circumstances surrounding the casualty incidents related to human error and equipment failure follow.

Human error

The tankers Emerillion and Baltimore Trader were docking at the time the casualties occurred. The Coast Guard investigator concluded that the Emerillion drifted into a mudbank because of negligence by the docking pilot. 1/ The Baltimore Trader struck a pier because of the docking pilot's failure, according to the Coast Guard, to accurately assess the effect of the wind and current on the tanker.

The tanker Winson was disabled because of an engineering problem and was being maneuvered at an anchorage by four tugs when it struck another vessel at anchor. The Coast Guard attributed this casualty to a judgment error by the docking pilot.

The tankers Bjorgfjell, Cuyama Valley, Marine Chemist, and Santos collided with barges which were under tow by tugs.

The Bjorgfjell was overtaking a tug with a barge in tow at the time of the collision. The Coast Guard investigator found evidence of violations of prescribed navigation practices on the part of the tug operator and concluded that the collision was caused by the failure of the tug operator to keep clear of the passing tanker.

The Cuyama Valley was also overtaking a barge under tow at the time of the collision. The Coast Guard investigator concluded that the collision resulted from a judgment error

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1/Master of a tug boat who usually boards the docking vessel and directs the docking maneuver.

by the tug master which allowed the barge to come too close to the overtaking tanker. This incident resulted in a minor spill of about 84 gallons of oil.

The Marine Chemist was proceeding upriver during a period of low visibility and a barge under tow was coming downriver when the collision occurred. The collision occurred according to the Coast Guard, because the Marine Chemist, while turning from one range or section of the river onto the next, failed to keep to its side of the channel.

The Santos was proceeding upriver at night when it collided with a U.S. Navy barge under tow. The Coast Guard investigator found evidence of violations of prescribed navigation practices on the part of the river pilot onboard the Santos, the master of the Santos, and the operator of the tug. The Coast Guard concluded that the proximate cause of the collision was the failure of the river pilot on board and the operators of the Santos to identify and locate the barge before proceeding up the main channel after they had clearly seen the towing vessel with lights indicating a tow astern. This collision resulted in a minor oil spill of about 20 gallons by the Santos.

Equipment failure

Equipment failures were cited by the Coast Guard as the causes of fires aboard the tankers Athenian and Almizar. A fire occurred in a pump room of the tanker Athenian while it was discharging cargo. The fire was caused by friction from a rubber hose when the hose came in contact with the operating cargo pump. The tanker Almizar was at anchor when a fire occurred in its foremast due to a leaking valve in the cargo vent system. The leaking valve allowed heated cargo vapors to escape and a short circuit in a section of defective wiring near the cargo vent ignited the vapors.

The tanker Sohio Resolute experienced a failure in a standby diesel generator. The failure was caused when water entered the crankcase of the generator through a defective water seal and came in contact with lubricating oil in the crankcase.

Equipment failures were also determined by the Coast Guard to be the causes of casualties involving the tankers Ariston, Valtierra, Puerto Rican, and Trinity Shipper. The Ariston and Valtierra grounded after they lost steering capability. A small pin worked loose from the Ariston's steering gear and it grounded lightly. The Valtierra grounded after its primary steering system failed. The Puerto Rican grounded because of a malfunctioning master

gyrocompass. The Trinity Shipper suffered two successive power losses to its engine and all power-operated equipment. While drifting, the Trinity Shipper rammed a barge which was moored while loading gasoline. This incident resulted in a minor spill by the barge of about 750 gallons of gasoline.

CHAPTER 3

EFFORTS TAKEN OR PLANNED TOWARD IMPROVING ENVIRONMENTAL PROTECTION AND VESSEL SAFETY

The Coast Guard has expanded its efforts to promote the protection of the environment from pollution and the safety of vessels. Some of these improvements have already been implemented but others are still under development. These improvements, such as proposed regulations concerning qualifications of personnel and equipment requirements will apply nationwide. Certain changes, such as improvements to the aids to navigation by the Coast Guard and dredging of certain anchorage areas by the Corps of Engineers, are attempts to improve the environmental protection and the safety of vessels in the Delaware River and Bay.

ENVIRONMENTAL PROTECTION EFFORTS

To minimize incidents which result in water pollution by oil and other substances, the Coast Guard has developed performance standards for the Port Safety and Marine Environmental Protection Programs. The standards specify the recommended performance levels in connection with (1) pollution prevention, (2) response to reported discharges of pollutants, and (3) investigation of discharges and accidents. The COTP can, based on local conditions and capabilities, deviate from the recommended performance levels.

Only 2 of the 13 performance standards for pollution prevention are within the scope of our review because they are the only ones that relate to tankship operations. The first pollution prevention standard sets a goal that 5 percent of all tankships entering a port be boarded and inspected to insure compliance with oil and hazardous substance discharge prevention regulations. During calendar year 1976 a total of 1,818 tankers arrived in the Port of Philadelphia. Coast Guard records shows that COTP personnel boarded 300 of these tankers, about 16 percent.

The other standard recommends that the Coast Guard monitor 25 percent of all liquid bulk transfer operations involving oil or hazardous substances. During calendar year 1976 a total of 6,012 liquid bulk transfer operations occurred on the Delaware River and Bay. Coast Guard records show that COTP personnel monitored 92 of these transfer operations or about 1.5 percent.

A Philadelphia COTP official confirmed this emphasis on tanker boardings instead of monitoring of transfer operations. He explained that based on past experience and their judgment, this use of limited human resources resulted in the highest implementation of pollution prevention measures possible to insure compliance with the oil and hazardous substances discharge regulations.

The Coast Guard also has several proposed regulations under consideration at this time. On April 25, 1977, proposed regulations were issued in the Federal Register governing the qualifications of the person in charge of oil transfer operations and of personnel involved in the handling, transfer, and transportation of dangerous cargoes in bulk aboard U.S. ships and barges. Public hearings were held by the Coast Guard in Washington, D.C., on June 21 and 22, 1977, and public comments were received by the Coast Guard until July 7, 1977. The Coast Guard planned to analyze the comments before taking final action.

Additional major regulations designed to protect the marine environment from oil pollution were proposed on May 16, 1977, in the Federal Register. These proposed regulations would apply to all U.S. and foreign oil tankers over 20,000 deadweight tons entering U.S. ports and would require double bottoms on all new tankers, segregated ballast on new and existing tankers, and inert gas systems on new and existing tankers. The proposed regulations also include requirements for improved emergency steering standards for tankers and backup radar systems and collision avoidance equipment for vessels over 10,000 gross tons. Public hearings were held by the Coast Guard in San Diego, California, and Washington, D.C., on June 16, 1977, and June 21, 1977, respectively. The public comment period will be open until September 1, 1977, and comments will then be analyzed before final action is taken.

Additional proposed regulations on pollution prevention were issued on June 27, 1977, in the Federal Register. The first of these proposed regulations would revise the pollution prevention regulations for vessels and oil transfer facilities to reduce accidental discharges of oil or oily wastes during vessel operations and during the transfer of oil or oily wastes to or from vessels. This proposal would also require the facility operator, or in the case of a vessel-to-vessel transfer, the vessel operator of the loading or unloading vessel to notify the COTP of the time and place of each oil transfer operation at least 4 hours before it begins. The other proposed regulations would establish requirements for installation of cargo monitors on all bulk oil vessels of 150 gross tons or more and impose a requirement for Coast

Guard approval of pollution prevention equipment such as oil-water separators, cargo and bilge monitors, and bilge alarms. The period for public comment was open until August 11, 1977, and the Coast Guard plans to analyze these comments before taking final action.

SAFETY OF VESSELS

To minimize casualty incidents, the Coast Guard enforces Federal regulations pertaining to commercial vessel safety aboard vessels and at waterfront facilities. To guide these efforts, the Coast Guard has established performance standards for its Commercial Vessel Safety Program governing the design, construction, maintenance, and operation of tank vessels.

The requirements of the Commercial Vessel Safety Program standards, with a few minor exceptions, apply only to U.S. vessels. Only 2 of the 12 Commercial Vessel Safety Program performance standards were within the scope of our review because they are the only ones related to tankship equipment safety and personnel qualifications. They include enforcing

--vessel equipment safety standards relative to the maintenance of inspected vessels and

--personnel standards and qualifications for all licensed and unlicensed personnel.

All U.S. flag tankships must be certified by the Coast Guard to carry flammable or combustible liquids, such as oil in bulk. The certification includes an inspection of the structure, boilers, machinery, equipment, apparatus for storage, and appliances of the vessel to insure that the vessel is in satisfactory condition and fit for the service for which it is intended, and that it complies with the applicable regulations for such vessels.

When a tankship is found to comply with the regulations, a certificate is endorsed "inspected and approved for the carriage of flammable or combustible liquids," and this endorsement serves as a permit for the ship to operate. The tankship must be reinspected every 2 years for a new certificate to be issued.

Each tankship holding a certificate of inspection must have a midpoint inspection between the tenth and fourteenth month of the period for which the certificate is valid. In general, the scope of this midpoint inspection is the same as for the inspection for certification, but in less detail unless it is determined that a major change had occurred

since the last inspection. In addition, each steel hull tankship is drydocked or hauled out for examination of the exterior hull. This inspection is made at 24-month intervals from last drydocking or hauling out, and can take place during a certification inspection, a midpoint inspection, or a separate inspection.

If the inspection reveals deficiencies, necessary repairs or improvements must be made to the satisfaction of the Coast Guard before the certificate is validated. Certificates of inspection for tankships may be revoked or suspended by the Coast Guard if the vessel does not meet the requirements of the regulations or if there is a failure to maintain the safety requirements requisite to the issuance of a certificate of inspection.

In our examination of specific casualties, we determined that, prior to the casualty, all the U.S. tankships had their most recent required inspections and any deficiencies had been corrected to the satisfaction of the Coast Guard.

Prior to January 1977, the Coast Guard did not inspect most foreign vessels visiting U.S. ports for safety requirements because the U.S. had ratified the International Convention for the Safety of Life at Sea, 1960 (SOLAS 60) which requires signatories to accept vessel and equipment inspections, licenses, and certificates from other signatory countries. SOLAS 60 was adopted under the sponsorship of the Inter-Governmental Maritime Consultative Organization (IMCO), a specialized body of the United Nations. IMCO has been working since 1958 to develop generally uniform laws governing marine affairs so that ships can carry on trade between nations in a cooperative manner and at the same time achieve high, practical standards for marine safety.

Since January 1977 the Coast Guard has taken steps to expand its vessel safety program, including more stringent inspection requirements and additional equipment requirements. In some instances the Coast Guard has extended domestic safety regulations to foreign as well as U.S. vessels.

The first action concerns the examination of cargo venting and handling systems and proper transfer procedures. A December 1976 tanker explosion resulting in the loss of life and vessel indicated to the Coast Guard the danger of unsafe and improper functioning cargo tank venting and handling systems. To reduce the potential danger that all tankships may pose to U.S. ports, Coast Guard Headquarters directed, on January 19, 1977, that all marine inspection offices, including the one in Philadelphia, examine such systems of all U.S.

and foreign flag tankships entering U.S. ports. This was supported by the President's message to the Congress on March 17, 1977, which contained a requirement that the Coast Guard board and examine each foreign flag tanker at least once a year. All deficiencies found during these inspections must be permanently repaired prior to the vessel's entry at another U.S. port.

As of June 27, 1977, the Marine Inspection Office, Philadelphia, had made 102 tankship cargo venting and handling system inspections, 98 of which were made on foreign flag tankship. Deficiencies of various types and of varying degrees were found in 61 percent of these inspections. For example, one inspection disclosed 33 safety deficiencies which prompted the COTP to order the tankship to depart a refinery and forbid it to transfer cargo except in a relatively remote anchorage area. The master of this ship was advised that the deficiencies were to be corrected prior to entry at another U.S. port.

In addition the Coast Guard issued safety regulations on January 31, 1977, effective on June 1, 1977, designed to reduce the number of major casulties. The rules apply to all foreign and domestic tankers in U.S. waters and require the vessels to carry on board a variety of navigational and safety equipment and current charts and nautical publications. The equipment, commonly installed but not previously required, included magnetic compass, gyrocompass, radar, and fathometer. Also on January 31, 1977, the Coast Guard proposed amending the navigational safety requirements by adding LORAN-C, a long range navigational aid, to the list of required equipment for vessels of 1,600 gross tons or more. Public hearings were held on March 4, 1977, in Washington, D.C., and on March 16, 1977, in San Francisco, California. Public comments were received until April 1, 1977, and the Coast Guard is now analyzing the comments before taking final action.

LEGISLATIVE ACTIONS

A bill (S. 682) to amend the Ports and Waterways Safety Act of 1972 was passed by the Senate on May 26, 1977, and would require navigational equipment, segregated ballast, gas inerting systems, and double bottoms (new ships only) on all U.S. and foreign tankers in U.S. waters. The act would write into law many of the above Coast Guard proposed rules and would provide specific legal basis for the administration of those regulations. S. 682 also amends section 4442 of the Revised Statutes (46 U.S.C. 214) to improve pilotage standards by having the Coast Guard establish stricter eligibility requirements for

the issuance and the renewal of a pilot license. In addition, it authorizes the Coast Guard to revoke or suspend a pilot's Federal license upon evidence of negligence or other just cause. This action against a Federal license would also apply if the pilot was acting solely under the authority of a State license.

EFFORTS TAKEN OR PLANNED FOR THE DELAWARE RIVER AND BAY

Improvements to aids to navigation

The Coast Guard establishes and maintains aids to navigation, including light structures, lightships, buoys, daybeacons (signals), short-range radio beacons, and fog signals. Although our review disclosed one incident related to aids to navigation, we did not find that this was a prevalent problem on the river. However, we found that the Coast Guard is continually upgrading or improving the aids on the river. The Third Coast Guard District has completed, received approval to proceed, or is considering the following projects to improve navigation on the Delaware River and Bay.

On March 10, 1976, a sea lane reorientation project affecting the Delaware to Cape Henlopen sea lane was completed. This project was undertaken in order to accommodate deeper draft vessels and involved the relocation of buoys marking the old sea lane to locations in deeper water.

Approval was received from Coast Guard Headquarters on February 9, 1977, for the establishment of buoys in the Delaware Bay entrance. This project was to relocate and/or change the characteristics of four lighted buoys; establish three lighted buoys; and relocate two unlighted buoys. The changes in this project were intended to increase the safety of the mariner and bring about more viable aids to the navigation system at the mouth of the Delaware Bay.

The Coast Guard was considering replacing buoys with beacons in the Delaware Bay. This project involved (1) converting six lighted and four unlighted buoys to eight fixed lights and one fixed daybeacon, (2) establishing one new light, and (3) rebuilding one light. One of the major objectives of this project was to correct a deficiency at the northern approach to the Mispillion River wherein many boats have run up on the submerged north jetty because of the inability to see the Mispillion South Jetty Light. As of June 3, 1977, this project had not been submitted to the Coast Guard Headquarters for approval.

The Coast Guard Base at Gloucester initiated a project on December 15, 1976, which involved changes to improve 28 range lights from Horseshoe Bend downstream to the lower Delaware River. The purpose of this project was to modernize and standardize existing lights. As of July 22, 1977, this project was 35-percent complete.

Long-range projects contemplated by the Third Coast Guard District as of June 2, 1977, included the possible establishment of a secondary channel for towboat traffic on the Delaware River and increasing the range of the radio beacon at Cape Henlopen.

Dredging of Delaware River channel and anchorages

The Corps of Engineers, Philadelphia District, is responsible for dredging and maintaining the channel and the federally authorized anchorages in the Delaware River. Channel dredging efforts are primarily concentrated on the channel area extending from Philadelphia to the sea. The Corps of Engineers uses a hopper dredge and hydraulic pipeline dredges to continuously vacuum the bottom of the Delaware and maintain its 40-foot clearance necessary for the navigation of today's larger vessels. During fiscal year 1977 more than 8 months of dredging effort are scheduled to be devoted to dredging and maintaining the channel to its improved 40-foot depth. During fiscal year 1976 dredging costs for the channel from Philadelphia to the sea were about $6.8 million and these costs are estimated at about $6.4 million for fiscal year 1977.

Anchorages have been established at regular intervals on the Delaware River and Bay to serve as refuges for vessels during periods when hazardous navigation conditions prevail, when ships are in trouble, and when docking facilities are not available. Another reason for providing adequate anchorages is that Federal law prohibits ships from anchoring in channels in such a way as to prevent passage of other vessels.

The maintenance dredging of two principal federally authorized anchorages--Marcus Hook and Mantua Creek--has been postponed in recent years because of a lack of funds. The Corps believed that maintenance dredging of these two anchorages is particularly important in order to provide safe anchoring areas for deep-draft vessels.

A maintenance dredging project for the Marcus Hook anchorage was approved by the Corps during fiscal year 1977. This project will provide for dredging the anchorage to a

40-foot depth and a width of 1,400 feet. Sufficient funds were not available to permit dredging to the authorized 2,300-foot width.

In addition, the Corps of Engineers, Philadelphia District, has requested that the maintenance dredging of Mantua Creek anchorage be scheduled for fiscal year 1979.

Vessel traffic service

There is a basic vessel traffic service in operation on the Delaware River and Bay. This system includes navigational regulations; a vessel traffic separation scheme; bridge-to-bridge and port operations communications network to facilitate the coordination of efforts as vessels transit the channel and maneuver to and from facilities; and a vessel reporting system managed by the Philadelphia Maritime Exchange and Pilots' Association for the Bay and River Delaware.

Although a basic vessel traffic service is in operation, recent casualties have stimulated considerable interest in the feasibility of installing a more sophisticated (electronic) vessel traffic service in the Delaware River and Bay. The Coast Guard has made two separate studies on this subject to date. The Coast Guard Headquarters study in 1973 entitled "Vessel Traffic Systems - Analysis of Port Needs," examined vessel casualties between 1969 and 1972 and concluded that an electronic service would not significantly reduce marine casualties on the Delaware River and Bay. The COTP of Philadelphia, in 1975, examined 120 casualties in this area between 1967 and 1974 and concluded that only 2.5 casualties a year, at best, could possibly have been prevented by an electronic service. Subsequent Coast Guard analyses of casualties have shown similar results. The Coast Guard has concluded that historically the savings and benefits that could have been achieved through electronic vessel traffic service preventable casualties, have not compared favorably with the cost of establishing and operating such a service. A Coast Guard official stated that over a 10-year life cycle, the annual cost of an electronic service in the Delaware River and Bay would be about $2 million, while the annual benefits would be only about $20,000. He said the 100 to 1 cost-benefit ratio was a good educated guess and probably on the conservative side.

In May 1977 the Coast Guard stated that there is a need to reexamine the Delaware River and Bay situation giving more attention to risk analysis associated with increasing oil imports, increasing vessel size, and the types of cargo transiting the river as opposed to the historical statistical

analyses made in the past. Since then the Coast Guard started a research effort to increase the degree of sophistication in methodology used in analyses of port needs. The Coast Guard expects this effort to be completed in about a year and a half. Additionally, the Coast Guard intends to hold public hearings by the end of 1977 in order to obtain the views of local government, maritime interests, and the public at large.

CHAPTER 4

COMMENTS OF FEDERAL AND LOCAL OFFICIALS AND OUR CONCLUSIONS

To obtain other opinions on what could be done to improve safety and minimize tanker pollution on the Delaware River and Bay, we discussed the causes of the incidents covered in chapter 2 with Coast Guard officials (headquarters, district, and local) and representatives of the Pilots' Association for the Bay and River Delaware. The general consensus of these officials is that although the Delaware River and Bay are relatively safe and well marked and maintained, additional things can always be done to make the river better and safer if sufficient funds are available.

COMMENTS ON MINIMIZING INCIDENTS CAUSED BY HUMAN ERROR

The types of human error that were determined to be the causes of the incidents we reviewed were either pilot error or crew member error. Although both the Coast Guard and the Pilots' Association pointed to the need for continuing training of personnel involved, the consensus was that incidents resulting from human error can never be completely eliminated.

However, the Coast Guard believes that better crew qualifications will help to minimize such incidents and pointed out that the proposed regulations of April 25, 1977, governing the qualifications of personnel involved in handling, transfer, and transportation of dangerous bulk cargoes aboard U.S. ships and barges should reduce, to some degree, personnel errors, and thus reduce pollution discharges similar to the minor pollution incidents covered in our review. The officials also said that the Coast Guard hopes to achieve higher international personnel standards through IMCO's Diplomatic Confererence on Standards of Training and Watchkeeping in June 1978.

Coast Guard officials did not think there was much that could be done to prevent the incidents caused by pilot errors because, in most cases, the pilot involved was well-trained and experienced but just made an error in judgment. The officials stated that the Coast Guard lacks any authority to act against any pilot operating under his State license, but pointed out that in S. 682, the Coast Guard would be able to revoke or suspend a pilot's Federal license, after notice and an opportunity for a hearing, where there was evidence of negligence or other just cause, including conduct when acting solely under authority of a State pilot license.

Representatives of the Pilot's Association stated that the local pilots are extensively trained in navigational practices and procedures and thoroughly familiar with conditions on the river, but in spite of this judgment errors still occur.

COMMENTS ON MINIMIZING INCIDENTS CAUSED BY EQUIPMENT FAILURE

Incidents caused by equipment failure included loss of steering power, engine failure, loss of astern power, and leaking valves in the cargo venting system.

Officials said that the Coast Guard has recently increased inspection emphasis on the steering gear and has alerted tanker owners of their responsibilities regarding steering problems and how they affect vessel seaworthiness. They pointed out that the May 16, 1977, proposed regulations requiring improved emergency steering standards could have had an impact on the Ariston and Valtierra steering casualties and might have prevented the Athos pollution incident. In addition, the proposed double bottom requirement, included in this regulation, might have prevented the Olympic Games incident. The representatives of the Pilots' Association agreed that the recent proposed regulation changes by the Coast Guard, particularly those regarding emergency steering standards, should help to prevent similar incidents in the future.

Also, in the Coast Guard officials' opinion, the venting inspections implemented in January 1977 have had an impact on foreign tanker safety. This inspection might have disclosed the leaking valve in the cargo venting system and possibly prevented the Almizar incident.

In summary, Coast Guard officials stated that the United States has the best and most comprehensive inspections in the world, but the key to preventing most equipment failures on all tankships is upgrading international standards for equipment, maintenance, inspection, and certification. They pointed out that a February 1978 diplomatic conference to improve tanker safety and pollution prevention will address these issues.

Finally, the Coast Guard officials pointed out that even though the primary cause of a pollution incident or a casualty was attributed to equipment failure, in many cases the underlying cause would involve human error in relation to improper maintenance, inadequate inspection, or faulty repair of the piece of equipment that failed.

COMMENTS ON ADEQUACY OF AIDS TO NAVIGATION

Representatives of the Pilots' Association stated that the proposed improvements to the aids to navigation discussed in the previous chapter will be very helpful to navigation. However, they felt that additional improvements are needed particularly to the buoys that mark the entrances of the two sea lanes leading to the Delaware Bay. They felt that these buoys should be equipped with radar transponders (electronic equipment that receives and transmits signals). They also felt that an additional radio directional finder should be installed at a location south of the existing one at Cape Henlopen, Delaware. These improvements would assist the tankship in locating the deep water approaches to the Delaware Bay and thereby prevent groundings in much shallower waters. A Coast Guard official stated that both suggestions seemed like a good idea, but a careful study of each would be needed before official comment could be made.

The representatives of the Pilots' Association strongly endorsed the project being contemplated by the Coast Guard to establish a secondary channel for towboat traffic which does not need to use the deep-draft channel. They believe this separate channel would greatly reduce congestion and reduce the possibility of collisions and rammings.

COMMENTS ON ADEQUACY OF MAINTENANCE OF CHANNEL AND ANCHORAGES

Both the Coast Guard and the representatives of the Pilots' Association stated that the Corps of Engineers does a good job of maintaining the Delaware River channel to its project depth (40 feet). The pilots, in particular, commented on the prompt corrective action taken by the Corps in response to reports of problem areas in the channel. The pilots pointed out that if more funds were available, the Corps could do more testing to identify areas of the channel needing to be dredged.

The representatives of the Pilots' Association agreed that the dredging project for the Marcus Hook anchorage will be very helpful. They pointed out, however, that this is not the entire solution to the problem, because the anchorages were not designed to accommodate the larger size ships. They suggested requiring the ships to anchor in the lower Delaware Bay, where there is plenty of room, until there are docking facilities available. The anchorages could then be reserved for emergency use.

A Coast Guard official stated that some U.S. ports do have a working agreement among the Coast Guard, the Pilots'

Association, and the maritime exchange similar to the Delaware pilots' suggestion. He pointed out that the anchorages are for the maritime and commercial interest of the United States and that the time it would take to bring tankers from the lower Bay to the Philadelphia area could adversely affect economic interests. The official stated that a feasibility study of the pilots' suggestion would be needed.

Coast Guard officials told us that, in addition to the Corps efforts to maintain the channel, the regulations which went into effect June 1, 1977, requiring vessels to carry current charts and nautical publications would help the pilots to navigate the river. In particular, they would have the latest information concerning areas of the channel affected by silt buildup.

CONCLUSIONS

From our examination of the statistics on both casualty and pollution incidents on the Delaware River and Bay, we did not find any significant trends showing either increases or decreases in occurrences with the exception of the decrease in number of minor pollution incidents reported. We, therefore, do not believe the safety of oil shipping and transfer operations has materially changed over the period covered by our review.

In general, knowledgeable officials of both the Coast Guard and the Pilots' Association believe that the operations on the Delaware River and Bay are relatively safe but suggested several changes that have the potential to improve safety on the river.

The conditions that we noted to be the causes of the majority of pollution incidents and casualties--human error and equipment failure--are, according to these officials, not easily correctable and probably cannot ever be completely eliminated. Coast Guard officials, however, believe that many of the recent regulations implemented or proposed should help to minimize the recurrence of these types of incidents. We agree that the requirements for navigational, steering, and pollution prevention equipment that apply to both U.S. and foreign tankships have the potential to reduce the types of incidents we examined. The proposed U.S. regulations and international efforts to improve crew qualifications should also help to reduce the instances of personnel error.

Our review did not reveal any need for extensive improvements in the maintenance of the channel or the

navigational system currently in operation, because very few incidents were identified that could possibly have been prevented if such improvements had been made. Even though the suggestions by the Pilots' Association regarding improvements in the aids to navigation and restrictions on the use of anchorages may have the potential to reduce the risks to vessels using the Delaware River and Bay, the cases we reviewed did not show that the aids to navigation and the anchorages were major problem areas.

Because of the number of cases in our sample involving a collision between a tanker and a barge under tow, we believe the project being contemplated by the Coast Guard to establish a secondary channel in the river has merit because it would remove the towboat traffic from the deep-draft channel.

The Coast Guard conducts periodic inspections of all U.S. tankers. The Coast Guard also boards a sample of all U.S. and foreign tankers when they enter a U.S. port to inspect for compliance with pollution prevention regulations. In addition to these existing programs, they recently instituted a program to examine cargo venting and handling systems and proper transfer procedures of all tankships at least once a year. This recent expansion of the inspection program should help to improve the safety of tankships entering all U.S. ports.

In view of the professed relative safety of oil shipping and transfer operations in the Delaware River and Bay, the improvements that should result from recent regulation changes that have been implemented or proposed, and the specific plans and actions being taken in the Delaware River and Bay, we are making no recommendations with respect to addtional safety improvements.

CHAPTER 5

SCOPE OF REVIEW

We concentrated our efforts on the operations of tankships because they have the greater potential for large catastrophic spills. Our analysis was limited to calendar years 1973-76, because before the passage of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 et seq.) statistics were either not accumulated or information available was not comparable to that obtained from pollution incident reports required by the above law. Senator Roth had requested that we consider expanding the scope of our review to cover the Chesapeake and Delaware Canal. We found, that there had been no large pollution or casualty incidents in the Canal during the period of our review; therefore, we did not cover the Canal.

Our review was made at Coast Guard Headquarters, Washington, D.C.; the Third Coast Guard District Office, New York, New York; the Office of the Captain of the Port of Philadelphia, Gloucester City, New Jersey; the Coast Guard Base Gloucester City, Gloucester City, New Jersey; and the Coast Guard Marine Inspection Office, Philadelphia, Pennsylvania. We interviewed appropriate officials of these locations and examined pertinent documents, procedures, and practices relating to their operations. We also held discussions with officials of the Pilots' Association for the Bay and River Delaware; U.S. Army Corps of Engineers, Philadelphia District; Philadelphia Maritime Exchange; Delaware River Port Authority; and the Delaware River Basin Commission.

APPENDIX I

WILLIAM V. ROTH, JR.
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COMMITTEES:
FINANCE
GOVERNMENT OPERATIONS

United States Senate

WASHINGTON, D.C. 20510

January 5, 1977

The Honorable Elmer B. Staats
Comptroller General of the United States
General Accounting Office
General Accounting Office Building
411 G Street
Washington, D. C. 20548

Dear Mr. Staats:

This is to request that your office conduct an investigation into oil shipping and transfer operations on the Delaware River and Bay.

As you have no doubt read, the tanker Olympic Games recently spilled about 135,000 gallons of oil into the Delaware River. This was the second major accident on the River in less than two years. Today's paper reports that yet another tanker, the Universe Leader, has run aground in the Delaware Bay. No oil spilled from the Universe Leader, but she was reportedly carrying one-half million barrels of Nigerian crude.

The recent series of major accidents have raised serious national and international policy questions regarding the operations of oil tankers, especially foreign flag vessels, in and near American waters. Narrower, but equally important questions are raised by the accidents on the Delaware Bay and River. Since these operations involve numerous jurisdictions and several governmental agencies, both State and Federal, an investigation by your office seems appropriate.

I am particularly interested in knowing whether the navigation control system is adequate, whether the channels are clear, and whether the tankers are inspected closely enough prior to entry.

As you may know, Secretary of Transportation Coleman has appointed a special task force to investigate the several oil spills and other incidents which have occurred recently. By separate letter, I am asking that this task force cooperate with you in exploring the special problems of the Delaware Bay and River.

APPENDIX I

Thank you in advance for your cooperation. I will look forward to your attention to this matter.

Sincerely,

William V. Roth, Jr.
U. S. Senate

WVR/jps

cc: William T. Coleman, Jr.
Secretary of Transportation

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