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ACTIVITIES RELATING TO TITLE II PORTS AND WATERWAYS SAFETY ACT --ETC(U)
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DEPARTMENT OF TRANSPORTATION

UNITED STATES COAST GUARD

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* Amended by the Port and Tanker Safety Act of 1978 dated October 17, 1978 (Public Law 95.474). Future reporting requirements will be in accordance with this Act.

CONTENTS

	PAGE
INTRODUCTION	1
EXECUTIVE SUMMARY	3
REPORT TO CONGRESS	8
I. A description of the rules and regulations prescribed by the Secretary (and related research and development work).	8
A. To improve vessel maneuvering and stopping ability and otherwise reduce the risk of collisions, groundings and other accidents.	8
1. Vessel system performance in the marine domain.	8
a. Regulations relating to vessel system performance.	9
b. Research relating to vessel system performance.	11
2. Human performance analysis in the marine domain.	11
3. Analysis methodology development.	13
4. Foreign tank vessel examinations.	15
B. To reduce cargo loss in the event of collisions, groundings and other accidents.	15
1. Rulemaking activity.	15
2. Research.	16
C. To reduce damage to the marine environment from the normal operation of the vessels to which this title applies.	20
1. Equipment requirements.	20
2. Personnel requirements.	23
a. Rulemaking activity.	23
b. Research.	25

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PAGE

II. The progress made with respect to adoption of international standards for the design, construction, alteration, and repair of vessels, to which the title applies, for protection of the marine environment. 26

A. International Conference on Tanker Safety and Pollution 26

B. Other international activity. 26

III. To the extent that the Secretary finds standards with respect to the design, construction, alteration and repair of vessels for the purposes set forth in I. A, B, or C above not possible, an explanation of the response therefore. 27

IV. Other Coast Guard activities related to the Act. 27

A. Review of the status of the six major Presidential Initiatives. 27

1. Ratification of the International Convention for the Prevention of Pollution from Ships, 1973. 27

2. Ship construction and equipment standards. 28

3. Crew standards and training. 29

4. Tanker boarding program and U. S. marine safety information system. 32

5. Comprehensive oil pollution liability and compensation legislation. 34

6. Federal oil pollution response capability. 34

B. Additional Initiatives. 36

APPENDICES 42

ABSTRACT

INTRODUCTION

This is the seventh annual report submitted pursuant to section 203 of the Ports and Waterways Safety Act of 1972. This Act was amended by the Port and Tanker Safety Act of 1978 enacted October 17, 1978 (Public Law 95-474). Future annual reports to Congress will be in accordance with this amendment. ← ABSTRACT

The Ports and Waterways Safety Act of 1972, Title II, Vessels Carrying Certain Cargoes in Bulk, which amended the Tank Vessel Act (46 U.S.C. 391a), states in section 4417a(7)(A) of the Revised Statutes:

> The Secretary shall begin publication as soon as practicable of proposed rules and regulations setting forth minimum standards of design, construction, alteration and repair of the vessels to which this section applies for the purpose of protecting the marine environment. Such rules and regulations shall, to the extent possible, include but not be limited to standards to improve vessel maneuverability and stopping ability and otherwise reduce the possibility of collision, grounding or other accident, and to reduce the damage to the marine environment by normal vessel operations such as ballasting and deballasting, cargo handling, and other activities.

Section 203 of the Act requires an annual report to Congress. as follows:

> Section 203. The Secretary of the Department in which the Coast Guard is operating shall, for a period of ten years following the enactment of this title, make a report to the Congress at the beginning of each regular session, regarding his activities under

this title. Such report shall include but not be limited to (A) a description of the rules and regulations prescribed by the Secretary (i) to improve vessel maneuvering and stopping ability and otherwise reduce the risks of collisions, groundings and other accidents, (ii) to reduce cargo loss in the event of collisions, groundings and other accidents, and (iii) to reduce the damage to the marine environment from the normal operation of the vessels to which this title applies, (B) the progress made with respect to the adoption of international standards for the design, construction, alteration, and repair of vessels to which this title applies for protection of the marine environment, and (C) to the extent that the Secretary finds standards with respect to the design, construction, alteration and repair of vessels for the purpose set forth in (A) (i), (ii), or (iii) above not possible, an explanation of the reasons therefore.

The Secretary of Transportation has delegated authority to the Commandant of the U. S. Coast Guard to issue regulations to implement the provisions of the Act. Additionally, Part D includes other activities relative to this Act.

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EXECUTIVE SUMMARY

Oil Pollution in the marine environment continues to be a major concern both nationally and internationally. Tank vessel accidents causing large oil spills, such as the grounding of the SS AMOCO CADIZ off the coast of France, continue to focus public attention on damage to the marine environment.

The SS AMOCO CADIZ (Liberian Flag) ran aground March 13, 1978 on the French coastline near Portsall, a small fishing port on the northwest coast of Brittany. During inclement weather, the vessel experienced a steering failure and grounded, with immediate cargo (crude oil) leakage into the sea. Subsequently, the ship broke in two, forward of the bridge and continued to break up due to heavy seas until its final intentional destruction (by bombardment) caused all of the remaining oil to be discharged into the sea. A total of 220,000 tons of oil was spilled. The winds and current carried the oil to the shoreline and seriously damaged the rich fishing, shell fishing and sea bird wildlife areas. The long-term effects of this spill cannot yet be assessed.

The adverse environmental and economic effects of this type of incident continue to demonstrate the need for ongoing efforts to improve the safety of maritime transportation systems.

The majority of the tanker safety and pollution prevention Presidential Initiatives proposed in 1977 by President Carter have been achieved internationally as a result of the February 1978 International Conference on Tanker Safety and Pollution Prevention (TSPP). This Conference considered proposals for modifications to the International

Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73), and the International Convention for Safety of Life at Sea, 1974 (SOLAS 74), along with alternatives proposed by other nations during preparatory meetings sponsored by the Intergovernmental Maritime Consultative Organization (IMCO). The conference was attended by delegates from 62 nations, 16 international organizations, and observers from three additional nations. The U. S. delegation was headed by the Deputy Secretary of Transportation and included representatives from the U. S. Congress, the State Department, the Coast Guard, the Environmental Protection Agency (EPA), the Council on Environmental Quality (CEQ), the National Oceanic and Atmospheric Administration (NOAA), the Maritime Administration (MARAD), industry, labor and non-governmental environmental organizations.

During the conference, three committees were established and joint working groups were formed to consider package proposals submitted by the joint Maritime Safety Committee/Marine Environmental Protection Committee (MSC/MEPC) for inclusion in Protocols modifying MARPOL 73 and SOLAS 74. The working groups considered and made recommendations concerning the following proposals:

1. Second Radar and Collision Avoidance Assistance (CAA);
2. Improved Steering Standards for Tankers;
3. Inspection and Certification of Tank Vessels;
4. Double Bottom/Protective Location of Segregated Ballast Tanks;
5. Clean Ballast Tank (CBT) Guidelines;
6. Crude Oil Washing (COW); and

7. Specific Trade and Special Ballast Conditions.

The working group recommendations were resolved by the committees and adopted by the Conference as Protocols to improve and expand the requirements of MARPOL 73 and SOLAS 74.

Regulations to implement the TSPP Conference have been drafted. Following approval by the Secretary of Transportation, it is expected these regulations will be published as notices of proposed rulemaking in early 1979.

One of the key Initiatives discussed at the TSPP Conference was Crude Oil Washing (COW). COW is an operational procedure which uses crude oil to clean cargo tanks. This technique has been developed since the opening sessions of MARPOL 73. In a very short period, COW has evolved from a tank cleaning procedure practiced by a few major oil companies to an internationally accepted method of reducing operational pollution. This fact is further evidenced by the 1978 TSPP Conference's recognition of the environmental benefits obtained from using COW, and its decision to include COW procedures on new and existing crude oil tankers. The Coast Guard completed a study evaluating the costs and benefits of COW and one of the conclusions states:

> Crude Oil Washing (COW) is a viable process. The economics of COW are proven and, from an operational standpoint, COW is an acceptable alternative to Segregated Ballast Tanks (SBT's) for existing vessels. Because COW is an operational procedure, certain precautions must be observed to ensure that COW is being conducted in the safest and most effective manner. If the

specifications developed by the TSPP Conference are followed, COW can be both a safe and effective method of cleaning tanks. The Coast Guard published a notice which sets forth the Coast Guard's intention with regard to the implementation of regulations, procedures for COW, and other 1978 TSPP Conference Protocols.

The Coast Guard has initiated a regulatory project concerning tank barges which proposes double hull construction for all new tank barges. This project is based upon several studies performed in recent years and is also in response to the Presidential Initiatives of March 1977. In addition, the Coast Guard intends to publish an advance notice of proposed rulemaking suggesting proposed regulations for the existing tank barge fleet to prevent pollution caused by hull damage and hasten the conversion to a double hull tank barge fleet. Comments will be solicited from all interested parties concerning the feasibility of the proposed approach and possible alternatives.

The International Conference on Training and Certification of Seafarers was held during June and July 1978. At the Conference, delegates from 72 nations agreed on the text of the world's first international convention establishing basic requirements for training, certification and watchkeeping for masters, officers and crews of seagoing merchant ships. Additional requirements regarding the training and qualification of masters, officers and ratings for oil, chemical and liquified gas tankers were developed as a result of resolutions adopted by the Conference.

The Port and Tanker Safety Act of 1978 (Public Law 95-474, October 17, 1978) directs the Coast Guard to undertake the following activities:

1. Promulgate conditions of port entry for tank vessels.

2. Allow expansion of current vessel traffic services to include reporting and operating requirements, routing systems, fairways and possible requirements for surveillance and communications equipment.

3. Conduct a study of traffic density and evaluate the need for additional safe access routes. This study is to be undertaken within six months.

4. Establish a mandatory annual inspection or examination program for all tank vessels servicing U.S. ports.

5. Establish improved standards for pilots, vessel operating personnel and minimum vessel manning.

6. Develop a Marine Safety Information System for tank vessels to provide details of ownership, financial responsibility, registration information, accounts of accidents or serious repair problems, and a record of prior inspections and examinations.

7. Develop detailed regulations for the conduct of lightering operations.

8. Specify design and construction requirements for crude oil tankers engaged in transfer of oil from the Outer Continental Shelf.

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I. A description of the rules and regulations prescribed by the Secretary (and related research and development work). PL 92-340 Sec. 203

The activities addressed below are divided into sections which are set forth in the Act. The regulations in Section A are designed to prevent collisions, thus preventing possible pollution. The regulations in Section B are designed to minimize possible pollution by reducing the outflow of cargo after a collision. The regulations in Section C are designed to prevent operational pollution not related to a vessel casualty. These classifications are used in the organization of this report.

A. To improve vessel maneuvering and stopping ability and otherwise reduce the possibility of collisions, groundings and other accidents. PL 92-340 Sec. 203

An analysis of the tank vessel system for the purpose of reducing the probability of collisions, groundings, and other accidents and to improve tank vessel maneuvering capability, has progressed along four areas involving tank vessel operations in the marine environment. These areas are:

- Vessel system performance in the marine domain;
- Human performance analysis in the marine domain;
- Analysis methodology development; and
- Foreign tank vessel examinations.

1. Vessel system performance in the marine domain.

The Coast Guard is continuing the task of acquiring the basic information needed to establish performance boundaries for the vessel sub-systems in order to define acceptable accident involvement probabilities or risk levels in merchant vessel operations. Current

efforts in this task are described below. These efforts are divided into two parts:

a. Regulations relating to vessel system performance.

(1) Notice of proposed rulemaking, Federal Register, VOL. 43, No. 77, Thursday, April 20, 1978 (See Appendix 1).

Note: Final regulations for Inert Gas Systems have been delayed as a result of revised applicability to new vessels as defined by the 1978 SOLAS Protocols. Because of this, the regulations will have to be revised as a new notice of proposed rulemaking.

(2) 46 CFR Parts 32, 35, 77, 78, 96, 97, 167, 184, 185, 195, and 196 - Vessel inspection regulations.

On January 31, 1977, the Coast Guard published a rule in the Federal Register interrelated with the Navigation Safety Regulations (33 CFR Part 164). The Vessel Inspection regulations require certain items of equipment, such as magnetic compasses, gyrocompasses, radiotelephones and radar, on U. S. vessels.

(3) 33 CFR Part 164 - Navigation safety requirements - proposed electronic navigation equipment for vessels of 1,600 gross tons or more.

A notice of proposed rulemaking was published in the Federal Register on November 14, 1977 proposing to amend the navigation safety requirements for vessels of 1,600 gross tons or more which were published on January 31, 1977. This proposed amendment, with certain exceptions, would require all vessels calling at ports in the continental U.S. or the Gulf of Alaska to have:

- A LORAN-C receiver that is warranted by the manufacturer as meeting specified requirements; or

- A continual update, satellite-based hybrid navigation receiver (i.e., satellite/doppler, satellite/inertial, or satellite/omega) that

is warranted by the manufacturer as meeting specified requirements; or

- A receiver other than a LORAN-C or satellite hybrid receiver,

that the Commandant finds as meeting the intent of the statements of availability, coverage, and accuracy for the U. S. Coastal Confluence Zone, contained in the U. S. Department of Transportation National Plan for Navigation, as amended. A final rule is expected to be published during the first quarter of 1979.

(4) 33 CFR Part 157 - Improved emergency steering standards for oil tankers.

On May 16, 1977, the Coast Guard published a notice of proposed rulemaking, to amend the rules for protection of the marine environment relating to tank vessels carrying oil in bulk by requiring improved emergency steering standards for all tank vessels of 20,000 dead weight tons (dwt) or more, both U.S. and foreign, that call at U.S. ports. This proposal implements the portion of the President's message of March 17, 1977 to Congress concerning measures for reducing pollution caused by tank vessel accidents.

The TSPP Conference has since adopted a set of improved steering gear standards which are essentially the same as standards set out in the Tank Vessel Act, as amended by the Port and Tanker Safety Act (PTSA) of 1978. The Coast Guard published a notice setting forth a plan (Appendix 1) to adopt these standards which, when published as proposed rules, will replace the May 16, 1977 notice.

Adoption of improved steering gear standards would reduce the probability of collision and grounding of oil tank vessels caused by steering failure and would, therefore, reduce the risk of oil

pollution as well as property damage, personal injury and death that could result from these accidents.

(5) 33 CFR Part 164 - Vessels of 10,000 gross tons or more, proposed additional equipment.

The Coast Guard has amended the Navigation Safety Regulations by adding a requirement for vessels of 10,000 gross tons (gt) or more, both U.S. and foreign, calling at U.S. ports to have a second radar system. This amendment was published as a final rule on July 24, 1978 (Appendix 2). This amendment implements that part of the President's message to Congress which considers a requirement for backup radar systems on all tank vessels of 10,000 gt and over entering U.S. ports. The proposed requirement for collision avoidance aids was withdrawn pending international action on the matter. Further rulemaking will be evaluated in 1979. The notice of proposed rulemaking for collision avoidance aids was withdrawn to allow IMCO to develop specifications for the equipment. A new notice of proposed rulemaking will be published to meet the requirement of the PTSA of 1978.

(6) Other regulations.

Other rulemaking activity related to the Ports and Waterways Safety Act is listed in Appendix 3.

b. Research relating to vessel system performance.

See Additional Initiatives on page 36.

2. Human performance analysis in the marine domain.

The Coast Guard has continued to pursue its efforts in the development of further information and data on the interactions of the

human controller, the complex vessel subsystems, people, training, equipment and the environment in ship navigation.

On an international level, a Coast Guard officer serves as the U.S. delegate on the Intergovernmental Maritime Consultative Organization (IMCO) Subcommittee on Standards of Training and Watchkeeping. This Subcommittee, at its 10th Session, completed a draft International Convention on Training and Certification of Seafarers for later presentation to the IMCO/International Labor Organization (ILO) Conference which was held from June 14 to July 7, 1978. This Conference adopted the text, with some amendments, as the final act of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978. The Convention incorporates special requirements for tankers; i.e., Mandatory Minimum Requirements for the Training and Qualifications of Masters, Officers, and Ratings of Oil, Chemical and Liquefied Gas Tankers. The Coast Guard is urging rapid acceptance of this Convention by all nations.

Domestically, the U.S. Coast Guard will publish a notice of proposed rulemaking regarding the training and qualification of masters, officers, and ratings for oil, chemical and liquefied gas tankers as a result of the resolutions developed at the International Conference on Training and Certification of Seafarers (June-July 1978). A copy of the results of the Conference is attached as Appendix 4 (FR of July 31, 1978). Future work of the Standards of Training and Watchkeeping Subcommittee will include the development of minimum international standards for vessel manning.

3. Analysis methodology development.

The Coast Guard has continued its efforts in the development of methods that will aid in the analysis and evaluation of alternatives for the reduction of accidents.

One study effort in this area is the development of a mathematical model of a river tow. The first phase of this effort was directed toward formulating the equations of motion for a river tow, carrying out of captive model tests, and then using the hydrodynamic data from these tests to simulate river towboat maneuvering. This phase was completed in 1978 and is available in two parts from the National Technical Information Service (NTIS):

- Simulation of Bridge Collision Incidents Involving Inland Waterway Tows, July 1978 NTIS AD A053644; and

- Simulation of Bridge Collision Incidents Involving Inland Waterway Tows: Program Users Documentation, June 1978 NTIS AD A058321.

The next phase of this effort is to verify the model by using full scale measurements. This phase started in late 1978 and is expected to take three years.

A second study involves the simulations of maneuvering motion of an 80,000 dwt tank vessel. Present efforts involve the refinement of the simulator by using scale model tests for verification. This mathematical model will be used to simulate a tanker entering New York harbor. A report of this study will not be available until early 1979. The model is presently being used by the Coast Guard to continue to study vessels entering harbors. The maneuvering model is also being used as a tool to compare maneuvering characteristics of various size tankers in the Presidential Initiatives (see para. 4, page 38).

The Coast Guard is using the simulator at the Maritime Administration's Computer Aided Operations Research Facility (CAORF) to study mariner safety behavior. The first study explored the mariners' understanding and use of changes to the rules of the road as a function of training and of ship type. The key change studied was the new freedom of stand-on vessels to avoid crossing collisions. Effects of traffic, sea room limitation, and situation ambiguity were considered.

An additional study was undertaken by the Coast Guard to determine the feasibility of requiring shiphandling simulator training for those masters, mates and pilots serving on large vessels. Phase I was completed in late 1978. While the report will not be published until early 1979, the objective of this study was to derive an evaluation criteria for acceptable simulator training. In addition, this study should point out the possible shortcomings of using simulators for training and evaluation. (See Crew Standards and Training under Status of Presidential Initiatives, page 29.)

The U. S. Coast Guard has recently undertaken three major navigation studies: One study, Pilotage in the Port of New York, is a fundamental, detailed investigation of the process and practices of ship navigation within U.S. ports; a second study of Task Performance Problems in Reports of Collisions, Rammings, and Groundings in Harbors and Entrances, describes the environmental and human factors in those accidents where this information can be extracted from written Coast Guard casualty reports; and the third study is titled Human and Physical Factors Affecting Collisions, Rammings and Groundings on

Western Rivers and Gulf Intracoastal Waterways. Insights provided by these studies are expected to help define specific problems and potential solutions relating directly to effective casualty reduction.

4. Foreign tank vessel examinations.

As a result of the large number of tanker incidents during the winter of 1976-1977, the U.S. Coast Guard, as part of its foreign tank vessel examination program, focused on eliminating possible dangerous cargo vapor emissions and likely sources of vapor ignition. The initial scope of the examination program has been expanded to ensure that each foreign flag vessel entering U.S. waters is in compliance with the general safety control provisions of SOLAS 60, the applicable international loadline convention (1930 or 1966), and all applicable U.S. regulations. The minimum manning by licensed officers for the safe operation of the vessel is also verified during the examination.

Analysis of available data concerning the results of examinations conducted from January 1977 through June 1978 shows that the program has achieved a measure of success with respect to raising the overall level of safety of tankers calling at our ports. Appendix 5 contains a description of the USCG foreign tank vessel examination program and an analysis of the results.

B. To reduce loss in the event of collisions, groundings, and other accidents. PL 92-340 Sec. 203

1. Rulemaking activity.

The International Conference on Tanker Safety and Pollution Prevention was held in London, England, from February 6-17, 1978 to

consider the U.S. initiatives together with alternative measures formulated at the previously held MSC/MEPC Joint Meeting. The results of the Conference are summarized in Appendix 6.

Measures adopted by the Conference are included in Annexes to Protocols to the two major Conventions, MARPOL 73 and SOLAS 74, and as Resolutions adopted by the Conference. Copies of these two Protocols are included as Appendix 7 and 8 respectively. The target date for the entry into force of the 1973 Convention, as modified by its Protocol, is June 1981. The effective date of the 1974 Convention is June 1979. The Coast Guard intends to construct regulatory implementation of these new requirements so that they come into force no later than the dates contained in the Resolutions and Protocols adopted by the Conference.

The anticipated plan for regulatory implementation by the Coast Guard of the results of the Conference is included as Appendix 1. A revision of this initial notice is included in Appendix 9.

In support of the work done preliminary to the Conference, a Draft Environmental Impact Statement was filed with the Council of Environmental Quality. A copy of this statement is included as Appendix 10.

2. Research.

The Liquefied Natural Gas (LNG) cargo tank design research project has been completed and a final report, Summary of Development of LNG Tank Design Acceleration Rules, has been published. This report shows that vertical acceleration of the cargo was the single most

important component which determines the design pressure. This report is available from the National Technical Information Service under accession number AD A038647.

The Coast Guard is investigating the behavior of unconfined fuel-air clouds when ignited. Liquefied Natural Gas (LNG) and Liquefied Petroleum Gas (LPG) are of primary interest in this vapor cloud explosion study. Work performed in 1978 included a series of LNG pool fires, LNG cloud fires, tests of a series of LNG vapor detectors, and the development of a laser vapor detector. Partial funding was received from the Department of Energy with the work performed at the Naval Weapons Center, China Lake, California.

In a related effort, the Coast Guard considered the possibility of detonation of an unconfined methane vapor cloud. The research used the technique known as the "Duel-FAE" (Fuel-Air Explosive) at Sandia Laboratories, Albuquerque, New Mexico. The test series were conducted in mid-December and the final report will be issued in early 1979.

The Coast Guard has underway a long-term effort to develop a complete risk analysis system. Currently, the Chemical Hazards Response Information System (CHRIS) and the Hazard Assessment Computer System (HACS) a computerized version of CHRIS, is a planning tool used to estimate the losses of people and property as a consequence of an accident. Work in 1978 focused on the development of one new model and the improvement of another; both will increase the capability of CHRIS, HACS, and the Population Vulnerability Model (PVM). A new system, the Marine Safety Management Methodology Synthesis (MSMMS), is under

development and is intended to link together the existing risk analysis tools and fill in any gaps.

A program is continuing on wave group analysis and accidental capsizing simulations. This computer model, which is designed to simulate large scale motions of a vessel, will be used to predict the conditions under which a vessel may capsize. The results of this type of simulation will be used to develop design standards to minimize the possibility of a vessel accidentally capsizing which could lead to pollution and loss of life.

The Coast Guard-sponsored Interagency Ship Structure Committee serves as a focal point for ship structure research conducted by the Navy, Maritime Administration, American Bureau of Shipping, and the Coast Guard. This committee has several ongoing projects that will contribute to the general understanding of how vessels operate in the marine environment and the structural standards necessary to insure their safe design.

The Cargo Tank Vent System Study investigated the design and performance of cargo tank vent systems. The study has been completed and the following reports have been published or will be published in early 1979:

- Design Criteria for Flame Control Devices for Cargo Venting Systems, NTIS number AD A015822;

- Blockage of Flame Control Devices: Design and Maintenance Criteria NTIS number AD A015143;

Note: NTIS numbers have not been assigned to the following reports to date

- Pressure Rise in a Vented Cargo Tank Due to External Heating;

- Performance of Commercially Available Flame Arrestors for Butane/Air and Gasoline/Air Mixtures;

- Flame Arrestor Design Requirements for Prolonged Exposure to Methane/Air, Butane/Air and Gasoline/Air Flames;

- Experimental Study of Flame Control Devices for Cargo Venting Systems;

- Vent Systems and Loading Criteria for Avoiding Tank Overpressurization; and

- Experimental Evaluation of Liquid Cargo Tank Overpressure.

In response to National Transportation Safety Board recommendations, the Coast Guard is studying the effectiveness of flame screens for stopping low-speed turbulent flame propagating in the open environment. The study will be completed in late 1979.

A study of the actions of sulphuric acid and oleum, which are highly reactive with water, is being conducted. If a large release of these products occurs, an aerosol or mist is likely. The size and composition of the cloud and the conditions under which it forms are not precisely known, and it is these properties that are being investigated in this study. Once these factors are known, risk assessment and response procedures can be developed.

A study of the behavior of anhydrous ammonia spills was begun in 1978. Spills on water and on land will give information about the dispersion of this toxic material. This study is scheduled for completion in 1980.

A theoretical study sponsored by the Coast Guard investigated and compared various models for calculating the dispersion behavior of vapor clouds resulting from LNG spills on water. The results of the study are reported in Predictability of LNG Vapor Dispersion from Catastrophic Spills onto Water: An Assessment, which is available from NTIS under accession number AD A040525. The study examined seven computerized models and determined that two warranted further study.

These models are being examined and this work will be completed in the spring of 1979.

In 1978, the National Academy of Science began a study of the future research needs of the Coast Guard in the area of Liquefied Natural Gas Safety. A report of this study is due for publication in the spring of 1979.

C. To reduce damage to the marine environment from the normal operation of vessels to which this title applies. PL 92-340 Sec. 203

1. Equipment requirements.

In the Sixth Annual Title II Report dated January 1978, the Coast Guard reported on the preparation of proposed oil pollution prevention regulations which would amend the present oil pollution prevention regulations and require, among other things, oil/water separators, oil content monitors and oil content alarms on vessels. These proposed regulations were published in the Federal Register on June 27, 1977. Extensive public comment has been received and three public hearings have been held. As a result, several changes were made, including the postponement of the requirement for oil/water separators, which will become the subject of a separate proposal following further study. The remaining regulations cover equipment and operating requirements for vessels transferring 250 barrels or more of oil.

The proposed rules for Self-Propelled Vessels Carrying Bulk Liquefied Gases, which were published on October 4, 1976, are in the last stages of approval before publication in mid-1979 as final rules. The proposed rules implement the provisions of the IMCO Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk,

Resolution A.328(IX). They contain design, construction, equipment and operating requirements for self-propelled vessels carrying bulk liquefied gases. The rules apply to new gas ships contracted for after October 31, 1976. A copy of this proposal was published in the January 1978 USCG/DOT report to Congress.

The Coast Guard published an advance notice of proposed rulemaking on June 30, 1977 that stated the intent to publish rules for existing gas ships carrying liquefied gases in bulk. It is proposed to upgrade some current U.S. regulations to meet IMCO standards. Where existing regulations exceed the standards of the Code, the existing regulations will be maintained.

The 1978 TSPP Conference addressed the use of Inert Gas Systems (IGS) by adding a Protocol to SOLAS 74. The Protocol extends the use of IGS requirements to:

- All new tankers over 20,000 dwt and above;
- All existing crude oil carriers 20,000 dwt and above and all existing product carriers 40,000 dwt and above;
- All existing tankers of 20,000 dwt and above where high capacity tank washing machines are fitted; and
- All tankers where COW is fitted.

A copy of work accomplished at the TSPP Conference is attached as Appendix 7 and 8.

Following the TSPP Conference, the Coast Guard performed a study (during May and June 1978) to determine if tanker safety and pollution prevention measures, in addition to those contained in 1978 Protocols to the SOLAS 74 and MARPOL 73 agreements, should be applied to U.S. tank vessels in domestic trade. The study examined the risks

associated with the marine transportation of oil by U. S. tank vessels in domestic trade, looked at the present and projected U. S. flag vessel fleet and associated oil movements, and possible hazards to people, property and the marine environment. Preventive actions, including extension of ship construction and equipment requirements contained in 1978 Protocols to SOLAS 74 and MARPOL 73 to smaller tankships, were identified and examined. Estimates were derived for:

- The impact of possible preventive actions on accidental and operational oil discharges and damage to the marine environment;
- Future tankship fires and explosions; and
- Transportation costs and projected capital requirements.

On the basis of information presented in the study, a key recommendation is to adopt additional measures aimed at controlling oil discharges from future transportation of Outer Continental Shelf (OCS) oil by U. S. tank vessels. Specific actions were recommended in an effort to obtain better information on quantities of oil discharged and effects on the marine environment and, further, to improve compliance with regulations already in effect.

The Coast Guard is developing revised regulations for unmanned barges carrying certain bulk dangerous cargoes, 46 CFR Part 151. The revision will be accomplished in three stages. The first stages will update the list of cargoes which are regulated under Part 151 and assign appropriate carriage requirements. The second stage will establish, if reasonable, standards for unmanned barges that are comparable to those provided for self-propelled vessels in 46 CFR 153. The third and final stage will establish standards which differentiates between

ocean-going barges and inland (i.e., river) barges.

The Coast Guard published a final rule, Safety Rules for Self-Propelled Vessels Carrying Hazardous Liquids, 46 CFR Part 153, on September 26, 1977. The rule implements the provisions of the IMCO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, Resolution A.212(VII). It contains design, construction, equipment and operating standards for self-propelled vessels carrying hazardous liquids in bulk. The rule applies to new and existing chemical carriers of U.S. or foreign flag registry. A copy of the final rule was published in the January 1978 USCG/DOT report to Congress.

2. Personnel requirements.

a. Rulemaking activity.

The Coast Guard is proposing to issue amending regulations governing various personnel licensing and certificating requirements. Among these is a notice of proposed rulemaking regarding the qualifications of personnel involved in the handling and transportation of dangerous cargoes in bulk aboard all vessels. This notice appeared on April 25, 1977 in the Federal Register. A review of the comments submitted in response to this notice has indicated that a considerable revision of the original proposal was required. Because of these revisions and also the need for incorporation of the special requirements for tankers contained in Chapter V of the recently adopted International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as well as the recommendations contained in the recent Government Accounting Office Report on Liquefied Energy Gases Safety,

No. EMD78-2 of July 31, 1978, and the passage of the Port and Tanker Safety Act of 1978 (P.L. 95-474), the original proposal is in the process of being withdrawn in favor of a new notice of proposed rulemaking to be issued in mid 1979. Tankerman certification is now required only for several grades of combustible or flammable products. It is necessary to extend such certification to dangerous liquids and liquefied gases.

In addition, it was decided that licensed officers shall no longer be considered qualified as tankermen solely by virtue of holding a license. Accordingly, this proposal provides that deck and engineering officers, as well as unlicensed personnel, will have to show qualifying service and complete Coast Guard approved training courses, or pass a written Coast Guard examination, in order to qualify as tankerman for the purpose of transferring oil and hazardous cargo in bulk. Included within these regulations is a proposal requiring firefighting training. A final rule will be published upon completion of the evaluation of the comments submitted in response to this proposal.

The Coast Guard intends to propose amending regulations governing the qualifications of personnel involved in the piloting of vessels required to be under the control and direction of pilots licensed by the Coast Guard. The qualification standards for Coast Guard licensed pilots have, to date, provided qualified personnel to navigate vessels on routes requiring Federal pilots. It is considered, however, that with the increasing traffic of larger vessels and the attendant safety and environmental considerations resulting from this traffic, additional personnel training through practical experience or the use of appropriate ship-handling simulators and recency of service are required to maintain

the appropriate level of personnel capability. It is anticipated that the proposal to amend the regulations will be published for public comment in early 1979.

b. Research.

In the continuing effort to measure the area of critical skills required by today's seagoing personnel, the Coast Guard has published two studies relating to personnel technical qualifications.

The first is entitled Recommendations for Qualifications of Engineering Personnel of Nuclear-Powered Ships and presents summary recommendations concerning training and other qualification requirements appropriate for personnel serving on commercial nuclear vessels. This report is available from the National Technical Information Service under accession number AD A029165.

Another report is entitled Handbook for the Development of Qualifications for Personnel in New Technology Systems. This handbook describes procedures for specifying the qualifications that should be required in the new shipboard work systems which arise because of newly developed technology. It also describes what workers must do in order for the system to function properly and this knowledge will provide a rational basis for setting qualification requirements. This report is available from the NTIS under accession number AD A027526. A similar study, not yet published, evaluates qualifications required for personnel in marine functions on mobile offshore drilling units.

The Coast Guard has completed a study concerning the pressure surges which may be caused by the operation of emergency shutdown valves in long pipelines at marine terminals. The study was

performed analytically using variables representative of the typical loading of a chemical or liquefied gas vessel. The results were presented at the Fifth International Symposium on the Transport of Dangerous Goods by Sea and Inland Waterways in April 1978.

II. The progress made with respect to the adoption of international standards for the design, construction, alteration and repair of vessels to which this title applies for protection of marine environment.

A. International Conference on Tanker Safety and Pollution Prevention.

Steps are being taken to obtain Senate advice and consent pertaining to ratification of the two Protocols adopted by the International Conference on Tanker Safety and Pollution Prevention in February 1978. These Protocols, when in force, will raise oil tanker standards worldwide. Early United States ratification of these Protocols, together with national implementation (already well underway), will encourage other governments to ratify without delay, thus hastening entry into force on a global basis.

B. Other international activity.

The 1978 Tanker Safety and Pollution Prevention Conference agreed to delay the implementation of Annex II of MARPOL 73 until 1984, in view of the difficulties of other nations in providing adequate reception facilities for noxious wastes from chemical tankers.

The IMCO Subcommittee on Bulk Chemicals held its fifth session during the year and continued to work on the following items that must be resolved prior to the coming into force of Annex II of MARPOL 73:

- Evaluation of noxious substances;

- Preparation of guidelines for the provision of reception facilities for noxious substances required by Annex II of the Convention;

- Development of procedures and arrangements for the discharge of noxious liquid substances.

In addition, the Subcommittee has developed the eighth set of amendments to the IMCO Chemical Code and the first set of amendments to the IMCO Gas Code. The Subcommittee is continuing to work toward harmonization of the two codes, since many ships carry both liquid chemicals and liquefied gases.

III. To the extent that the Secretary finds standards with respect to the design, construction, alteration, and repair of vessels for the purpose set forth in I. A, B, or C above not possible, an explanation of the reasons therefore.

There are no areas where action is mandated by the Act in which implementing rules and regulations cannot be made. However, it is realized that the progress of defining rules and regulations for maneuverability, along with groundings and other accidents, is moving slowly because of the complexity of the problem.

IV. Other Coast Guard activities related to the Act.

A. Review of the status of the six major Presidential Initiatives.

1. Ratification of the International Convention for the Prevention of Pollution from Ships 1973.

The International Conference on Tanker Safety and Pollution Prevention (TSPP Conference) on February 17, 1978, adopted the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973. This 1978 Protocol incorporates and modifies the 1973 Convention. The United States will only ratify the

Protocol since it incorporates the Convention. Correspondence to seek Senate advice and consent concerning the Protocol was signed by the President on January 4, 1979. It recommends that the Protocol be substituted for the 1973 Convention which was submitted for advice and consent on March 22, 1977.

S. 2346 and H.R. 10390, which would have implemented the Convention, were not acted upon by the 95th Congress. Legislation to implement the new Protocol will be submitted to the 96th Congress. The Protocol's design, construction, and equipment standards for oil tankers can be implemented by the United States through Coast Guard rulemaking pursuant to the Tank Vessel Act, 1978. Implementing legislation for the MARPOL 73 Convention would give the Coast Guard strong authority for requiring the provision of port waste reception facilities.

2. Ship construction and equipment standards.

Proposed regulations, published in the Federal Register on May 16, 1977, addressed double bottoms, segregated ballast, inert gas systems, improved steering systems and back-up radar with Collision Avoidance Assistance (CAA). The period for comments from the public was extended from September 1 through November 15, 1977. The requirement for back-up radar was published as a final rule on July 24, 1978 and the proposal for CAA equipment was withdrawn. Further proposals for CAA will await IMCO action pertaining to the development of performance standards for the equipment.

The President's initiatives on ship construction and equipment standards were presented to the international community and considered at the Intergovernmental Maritime Consultative Organization

(IMCO), and at the TSPP Conference, held in London from February 6-17, 1978. The Conference adopted Protocols to the 1974 Safety of Life at Sea and 1973 Marine Pollution Conventions. The President's proposals or their equivalents for design, construction and equipment standards for tankers were adopted. The only deviations from the U.S. proposals for new tankers were exemption of small product carriers from the segregated ballast tank requirement and also adoption of the protectively located segregated ballast instead of double bottoms. For existing vessels, crude oil washing systems were considered equivalent to segregated ballast tanks for environmental protection purposes and could be used as an alternative. Section 5 of the Port and Tanker Safety Act of 1978 (P.L. 95-474) mandates minimum equipment and construction requirements which are, for the most part, consistent with the requirement described above.

The Coast Guard is now working to implement these standards as Federal regulations. In support of this effort, the Coast Guard has:

- Issued Notices in the Federal Register on April 20, 1978 and September 21, 1978 to inform concerned parties of the international requirements agreed to and the course of action to be taken by the Coast Guard;

- Completed a study with MARAD, NOAA, EPA, CEQ, and other interested agencies of Tanker Safety and Pollution Prevention Requirements for U.S. Tankers in domestic trade; and

- Drafted comprehensive regulations implementing construction and equipment standards. These proposed regulations are expected to be published in early 1979.

3. Crew standards and training.

The Coast Guard is intensifying its efforts to improve personnel qualifications. In addressing licensing and qualification

standards, the status of actions taken is as follows:

a. The IMCO International Conference on Training and Certification of Seafarers met in London during the period June 14-July 7, 1978. The Conference established an international standard for certification of deck and engineer officers and unlicensed ratings in the deck department. Minimum standards of sea service, training, professional examination, physical requirements and watchkeeping were agreed upon to insure an adequate level of qualification for seafarers of all countries. It is expected that the standards established at this Conference will be implemented on a voluntary basis upon entry into force of the Convention, these requirements will be mandatory for all crews of vessels of nations signatory to the Convention and also to crews of vessels of nations not signatory to the Convention if their vessels enter a port of a nation which is signatory to the Convention. A notice of the international requirements agreed to, and the course of action to be taken by the Coast Guard was published in the July 31, 1978 Federal Register.

b. New Tankerman Requirements were published as a notice of proposed rulemaking on April 25, 1977, and public hearings were held on June 21-22, 1977 with comments accepted through July 7, 1977. Because of the volume of comments received, the recently adopted IMCO International Convention for the Standards of Training, Certification and Watchkeeping for Seafarers, 1978, the recent Government Accounting Office (GAO) Report of Liquefied Energy Gas Transportation and the passage of the Port and Tanker Safety Act of 1978 (P.L. 95-474), the proposed rules will be withdrawn and a new revised notice of proposed

rulemaking will be published by mid 1979.

c. Revision of the licensing requirements for pilots is presently in the drafting stage. This is considered to be a significant regulatory project and will be issued as a proposed rule early in 1979. The proposed amending regulations should be implemented as final regulations in late 1979.

d. The Coast Guard is presently considering the feasibility of requiring shiphandling simulator training for those Masters and Chief Mates who are serving on very large vessels whose size and maneuvering characteristics differ significantly from smaller vessels. Revision of the licensing regulations to require such training is pending completion of a study to be conducted for the Coast Guard to determine which simulator training may be substituted for shipboard experience. It is anticipated that phase I of this study will be completed in late 1978.

e. The Coast Guard published a proposed rule on January 17, 1977 which would have required merchant marine officers whose licenses were being renewed as a master, mate or pilot on inspected vessels of 300 gross tons or over, to obtain a radar observer's endorsement if they were to serve in <u>any</u> capacity under the authority of that license. Due to the numerous objections and emphasis on demonstrated skill instead of written examinations, this proposal is being withdrawn and a new proposal is being drafted. This revised proposal will amend regulations pertaining to the radar observer endorsement by providing that a licensed deck officer can obtain a radar observer's endorsement only by attending a Coast Guard approved radar training facility and exercising on a radar

simulator. It will also provide that a licensed deck officer can serve under authority of his license without a radar observer's endorsement if the type of service does not require "radar observers." A new proposed rule should be published in early 1979, and a final rule issued in mid 1979.

4. Tanker boarding program and U.S. marine safety information system.

The tanker boarding program to examine annually each foreign tank vessel calling at U. S. ports is an expansion of an existing boarding and examination program. The Coast Guard expanded the scope of this program in January 1977 with initial emphasis on the examination of cargo venting and handling systems and proper transfer procedures. In response to the Presidential Initiatives, the scope of the program has been formalized and further expanded. The program now includes an examination to insure that each foreign flag vessel entering U. S. waters is in compliance with the general safety controls of SOLAS 60, the applicable International Load Line Convention, and all applicable U. S. regulations. To accomplish this, the Coast Guard has requested and has received additional inspection personnel during fiscal year 1979.

The Coast Guard has modified and enhanced the capabilities of the existing Port Safety Reporting System (PSRS) so that it meets the criteria established by the President for the U. S. Marine Safety Information System (MSIS). The purpose of the MSIS is to maintain records of vessel casualties, pollution incidents, violations of Federal

safety and pollution prevention regulations, and names of vessel owners. Coast Guard Marine Safety Offices (MSO's), Coast Guard Captains of the Port (COTP's) and Coast Guard Marine Inspection Offices (MIO's) have the capability to access a vessel's history and enter the results of boardings and inspections through a port network of remote terminals. Major coastal, inland waters and Great Lakes ports in the continental U. S., Alaska, Hawaii and Puerto Rico are included in the MSIS.

In addition, each Coast Guard district office has a computer terminal to access the MSIS to retrieve histories of responsible parties involved in repeated violations of Federal pollution regulations. This information is considered by the district hearing officer in the civil penalty assessment process.

The Coast Guard MSIS contains historical information on foreign tank vessel casualties and pollution incidents to complement the established violation history of vessels calling at U.S. ports. The MSIS is operational 24 hours a day to retrieve vessel histories and update vessel boarding and examination information.

In further response to the President's March 17, 1977 message to Congress, the Coast Guard issued a notice of proposed rulemaking in the Federal Register on April 13, 1978. The proposed rule would have required oil tankers of 20,000 dwt or more which enter the navigable waters of the U.S. or the Safety Zones of a U.S. deepwater port to engage in commercial service, to report certain ownership information, all registered names the vessel has had since it began operation, and the country of current registry. This information would be incorporated in

the MSIS. Three public hearings on this issue were held during May in New York, N.Y., Long Beach, Calif. and Houston, Tex. In response to comments received from the State Department and several foreign governments (objecting to parts of the proposal), and also to statements made by Congressmen during passage of the Port and Tanker Safety Act in September 1978, the Coast Guard is preparing to withdraw the proposed rule. Since the rule was proposed, the Coast Guard has obtained much of this information from other sources, for inclusion in the MSIS.

5. Comprehensive Oil Pollution Liability and Compensation Legislation.

A new comprehensive Oil Pollution Liability and Compensation Bill (Superfund) will be introduced to the 96th Congress. The bill is in the drafting stages.

The Outer Continental Shelf Lands Act Amendments Bill was enacted on September 18, 1978 (P.L. 95-372). Presidential and Secretarial delegations, notice of proposed rulemaking, Claims Contract Invitations, and Appropriations Requests under this Act have been prepared.

6. Federal Oil Pollution Response Capability.

The following studies, undertaken in response to the President's Initiatives relating to a six-hour response to a 100,000 ton oil spill have been completed. The integrated study report entitled A Recommended Plan for Implementing Presidential Initiatives Concerning Oil Pollution Response, dated October 10, 1978, has been reviewed by

the Executive Branch. This report includes the costs and feasibility of upgrading the Coast Guard's ability to respond to oil spills.

a. A national inventory of pollution response equipment.

An inventory of existing pollution response hardware and required support equipment was conducted to determine the type, amount and the geographical location of equipment in the custody of governmental agencies, oil cooperatives, oil companies, and private cleanup contractors. The inventory is operational and the information is readily available through a network of dataphone terminals and is continually being updated by local Coast Guard commands.

b. Establishment of locations for siting response equipment.

The Transportation Systems Center has completed work on this study and a final report was received on September 19, 1978. Operations research techniques were used to determine the most probable locations of future major pollution incidents based on historical spill data and other historical information systems, best available information on the expected positions of deepwater ports and offshore exploration sites, and projected tanker traffic density data. The information was used to determine the locations where equipment should be sited to permit the Coast Guard to respond within six hours of notification.

c. Assessment of requirements to respond to a catastrophic spill.

The potential for spills of larger and larger proportions has increased to the point that it has become necessary to evaluate quantitatively the Coast Guard's ability to cope with spills of

significant proportions. A study was undertaken to determine the amount and type of equipment which should be kept in inventory to provide a capability to deal with a spill of 100,000 ton proportion. The information was to be developed in such a way that the resources necessary for achieving various levels of the goal were identified. The results of this study have been incorporated with the siting study by the Transportation Systems Center (b. above) into a final report submitted to the Coast Guard on September 19, 1978.

d. A determination of the feasibility of developing an improved open water, extreme weather response capability.

This study was initiated by Seaward International in November 1977, and completed during August 1978. A survey of mission performance requirements, an evaluation of state-of-the-art response systems and a consideration of new response concepts were included. The composition of a Coast Guard extreme weather response system together with a delineation of development work needed to produce it have been recommended. Seaward is presently developing an extreme weather pollution response guide for field use under the same contract. The draft guide has been submitted to the MSO's and strike teams for comment with the final version to incorporate these comments.

B. Additional Initiatives.

1. An evaluation of the costs and benefits of a crude oil washing systems, a system which utilizes crude oil to clean cargo tanks, has been completed. The evaluation took into account information provided by other governments at IMCO and was used in developing the U.S.

negotiating position for the February 1978 Plenipotentiary Conference. The study, along with recommendations on the use of crude oil washing as an alternative to segregated ballast, was forwarded to the Secretary on April 7, 1978. The results of the February 1978 IMCO Conference on Tanker Safety and Pollution Prevention impact on the Crude Oil Washing study findings and are included in the report which was forwarded to the President on May 1, 1978 (Appendix 11). A related study conducted by the Organization for Economic Cooperation and Development (partially funded by the State Department and Coast Guard) evaluated the economic and political (including environmental) implications of retrofitting segregated ballast in existing oil carriers.

2. A study on tank barge oil pollution was completed by the Vitro Laboratory Division of Automation Industries, in February 1978. This study and the 1974 Coast Guard/MARAD Tank Barge Study were utilized in preparing a response to the Presidential Initiatives for additional study of the tank barge pollution problem. This report, entitled U.S. Coast Guard Implementation of Presidential Initiatives for an Evaluation of Design, Construction and Equipment Standards for Tank Barges Which Carry Oil, was completed August 1, 1978, and forwarded to the President (Appendix 12). As a result of this evaluation, a regulatory project for new and existing tank barges has commenced. This project will propose rules to require new tank barges to be double hulled and will establish a method for phasing existing single hulled tank barges out of the fleet. A notice of proposed rulemaking for new barges and an advance notice of proposed rulemaking for existing tank barges will be published together

in early 1979. A single regulatory analysis and environmental impact statement will be prepared for the two actions. This is being done so that the entire scope of the Coast Guard's regulatory action and its effects on the tank barge industry are clearly presented.

3. A study of long-range vessel surveillance and control system is complete, and the final vessel study report was transmitted to the President for review on September 27, 1978. The report provides a comprehensive examination of the problem and its potential solutions. Eighteen systems, ranging from basic procedural changes to sophisticated surveillance techniques, are evaluated to estimate their effectiveness in preventing tanker offshore casualties. The study concludes that there is no present justification for long-range vessel surveillance and control type systems. The recommended approach is a communications based reporting and advance clearance system to ensure that tankers bound for U. S. ports are properly manned and equipped and do not constitute a hazard to safety. Other recommendations include changing equipment and licensing requirements, reviewing pilotage practices in two areas, and examining expanded use of certain electronic aids to navigation. These recommendations are now undergoing detailed Coast Guard evaluation to determine implementation feasibility and schedule.

4. An evaluation of devices to improve maneuverability and stopping ability of large tankers, with research to include the use of ship simulators will be ready for the President by August 31, 1979. An in-house problem definition study is now in progress to identify specific questions concerning relationship of maneuvering and stopping

ability to the overall problem of vessel control and the effect certain devices have on the handling characteristics of vessels. The actual evaluations of the potential these various devices offer for reducing collisions, rammings and grounding accidents will involve engineering analyses, model tests, shiphandling simulators and full-scale experiments extending over a considerable period of time.

5. A study of the fee collection mechanism for the Comprehensive Oil Pollution Fund was cleared internally, and by the designated staff members of the Departments of Commerce, Energy and Treasury. The final report (CG-WEP-78-1) has been printed and was forwarded to the President on December 12, 1978. Copies of the report will be forwarded to the respective Secretaries of Commerce, Energy and Treasury by Secretary Adams.

6. The Coast Guard performed a study to determine if additional tanker pollution prevention requirements should be applied to U. S. tank vessels in domestic trade. On the basis of information presented in the study, a key recommendation is the adoption of additional measures to control oil discharges resulting from transportation of OCS oil to shore by U.S. tank vessels. Otherwise, requirements for segregated ballast tanks should not be extended to smaller U.S. tankships in domestic trade. However, specific actions are recommended in an effort to obtain better information on quantities of oil discharged and its effect on the marine environment, and also to improve compliance with regulations already in effect. A copy of this study is available from the National Technical Information Service (NTIS) under accession number AD A057607.

7. Due to the present interest in marine vapor control systems resulting from air quality standards, the Coast Guard is sponsoring a study entitled Detonation Arrester Devices for Gasoline Cargo Vapor Recovery Systems. The purpose of the study is to determine the effectiveness and adequacy of detonation arresting devices for use in these systems. The study will experimentally develop parametric data on the flame speed, flame acceleration, run-up distance to detonation, pressure build-up due to a detonation and pressure levels resulting from reflected shock waves from combustion of gasoline/air mixtures. It will also evaluate the effectiveness of several selected arresting devices for quenching detonations resulting from the ignition of gasoline/air and propane/air mixtures. A report detailing the results of this study will be available in early 1979.

8. The proposed rules for carriage of benzene, which were published on August 21, 1978, are being revised and should be published as a final rule in mid-1979. The intent of the rule is the protection of the maritime worker. The rule will implement the Occupational Safety and Health Administration's (OSHA's) existing acceptable benzene exposure level.

9. The Toxic Interactions Panel of the National Academy of Science's Committee on Maritime Hazardous Materials is conducting an evaluation of the hazards associated with maritime personnel exposure to multiple cargo vapors. The study began in mid 1978, and should conclude in the spring of 1979. The study is theoretical and, based upon the results, an experimental examination may be performed.

10. The Hazard Evaluation Criteria Panel was formed under the Committee on Maritime Hazardous Materials in the National Academy of Sciences to select or develop criteria for characterizing the hazards of bulk liquid chemicals, and correlate them with marine design features and operating practices for bulk handling, containment and movement. The date of completion of the tasks assigned to this Panel is dependent upon progress made at the February 1979 IMCO meeting.

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APPENDICES

1. Federal Register of April 20, 1978 (CGD 78-053) Tanker Safety and Pollution Prevention Information and Regulatory Implementation Plan.

2. Federal Register of July 24, 1978 (CGD 77-016) Navigation Safety Regulations - Additional Equipment for Vessels of 10,000 Gross tons or more.

3. Rulemaking Activity Through December 1978.

4. Federal Register of July 31, 1978 (CGD 78-100) Standards of Training and Certification of Seafarers.

5. A description of the USCG Foreign Tanker Vessel Examination Program and an Analysis of the Results of the Program from Jan. 1977 through June 1978.

6. Background and Summary Regarding the International Conference on Tanker Safety and Pollution Prevention Held in London, England 6-17 February 1978.

7. Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973.

8. Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974.

9. Federal Register of September 21, 1978 (CGD 78-053a) Tanker Safety and Pollution Prevention: Revision to Regulatory Implementation Plan Schedule.

10. Draft Environmental Statement for the International Conference on Tanker Safety and Pollution Prevention.

11. U.S. Coast Guard Implementation of Presidential Initiatives for Evaluation of Costs and Benefits of Crude Oil Washing, May 1, 1978.

12. U.S. Coast Guard Implementation of Presidential Initiative for an Evaluation of Design, Construction, and Equipment Standards for Tank Barges Which Carry Oil, August 1, 1978.

APPENDIX 1

federal register

THURSDAY, APRIL 20, 1978
PART II



DEPARTMENT OF TRANSPORTATION

Coast Guard

TANKER SAFETY AND POLLUTION PREVENTION

Information and Regulatory Implementation Plan

[4910-14]

DEPARTMENT OF TRANSPORTATION

Coast Guard

[CGD 78-053]

TANKER SAFETY AND POLLUTION PREVENTION

Information and Regulatory Implementation Plan

PURPOSE

The purpose of this Notice is to inform the public of the results of the International Conference on Tanker Safety and Pollution Prevention, held under the auspices of the Intergovernmental Maritime Consultative Organization (IMCO) from February 6 through 17, 1978; to provide the public with the anticipated plan for regulatory implementation by the Coast Guard of the results of the Conference, and to acquaint interested parties with other efforts being undertaken concerning tank vessel safety and pollution prevention.

BACKGROUND

During the winter of 1976-77, several tanker casualties occurred in or near U.S. waters which demonstrated a need for a global effort to improve the level of safety of tank vessels and decrease their pollution potential.

President Carter, in a March 17, 1977, message to Congress, proposed a series of initiatives on tank vessel safety and pollution prevention which should be taken nationally and internationally. The initiatives were broad in scope and covered three major areas:

1. Improved Inspection and Certification.
2. Improved Crew Standards.
3. Improved Vessel Construction and Equipment Standards.

Improved inspection and certification standards and procedures, as well as improved construction and equipment standards, were the subject of the International Conference on Tanker Safety and Pollution Prevention. The improvement of crew standards will be the subject of a major International Conference on Training and Certification of Seafarers which is to be held from June 14 to July 7, 1978 under IMCO auspices.

Individuals or parties interested in further details concerning the background and results of the February Conference may obtain further documentation from the Coast Guard. Two documents have been prepared for distribution. The first is a collection of papers accepted by the Conference. Every effort has been made to ensure their accuracy; however, the *official* documents from IMCO will not be available until June 1978, due to the need for translation into four official languages. The second document is an expanded technical summary which provides additional background as well as detailing the technical results of the Conference.

These documents may be obtained by writing: Commandant (G-MMT-1/82), U.S. Coast Guard, Washington, D.C. 20590.

CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION, FEBRUARY 6-17, 1978

SUMMARY OF AGREED MEASURES

Imprtant new measures and procedures to improve the safety of oil tankers, and help prevent pollution of the sea from ships have been adopted by the conference. These new measures improve and expand the requirements of the 1973 Marine Pollution Convention (MARPOL 1973) and the 1974 Safety of Life at Sea Convention (SOLAS 1974). The new measures relating to MARPOL 73 are included in a Protocol which incorporates and modifies MARPOL 73 (MARPOL Protocol). The new measures relating to SOLAS 74 are included in a Protocol which supplements SOLAS 74 (SOLAS Protocol). Target dates have been set for implementation of the MARPOL Protocol, the SOLAS Protocol, and the SOLAS 1974 Convention. Procedural arrangements have been formulated nationally for bringing the new measures into force. The work of the Conference and its outcome are described under the following headings: Design and Equipment, Inspection and Certification, and Procedural Arrangements.

DESIGN AND EQUIPMENT

1. *Segregated Ballast—New Tankers.* The MARPOL 1973 Convention requirement for segregated ballast tanks (SBT) was limited to new tankers of 70,000 deadweight tons (dwt) and above. This requirement has been extended to include all new crude oil carriers of 20,000 dwt and above, and all new product tankers of 30,000 dwt and above. The MARPOL 1973 Convention presently does not contain any requirement for the segregated ballast to be particularly located in a manner to provide protection against collisions or groundings. The Conference unanimously agreed to a new concept of protective location of the segregated ballast tanks, rather than a mandatory requirement for double bottom tanks.

The Conference recognized the environmental benefits of the crude oil washing (COW) technique developed in the years since the MARPOL 1973 Convention and decided that, in addition to the protectively located segregated ballast tank requirement, all new crude oil carriers over 20,000 dwt must be fitted with an approved COW system.

2. *Segregated Ballast or Equivalent in Existing Tankers.* As of the date the MARPOL Protocol enters into force, all existing crude oil carriers of 40,000 dwt and above must be operated with either SBT, clean ballast tanks (CBT), or approved COW for which requirements and specifications were formulated. Two years later, the CBT option ceases for crude oil carriers over 70,000 dwt and above, and after a further two years, for crude oil carriers of 40,000 dwt and above.

Existing product tankers of 40,000 dwt and above must be operated with either CBT or SBT from the date the MARPOL Protocol enters into force.

3. *Drainage and Discharge Arrangements.* Requirements for improved drainage and discharge systems for new and existing tankers have been introduced to reduce the amount of oil remaining in tankers after discharge, and limit their pollution potential.

4. *Inert Gas Systems for Protection of Cargo Tanks.* The 1974 SOLAR Convention requirements for inert gas systems were limited to new oil tankers over 100,000 dwt, and new combination carriers over 50,000 dwt. The SOLAS Protocol extends the inert gas system requirements to:

(i) All new tankers over 20,000 dwt.

(ii) All existing crude oil carriers over 20,000 dwt and all existing product carriers over 40,000 dwt (there is provision for exemption of crude oil carriers between 20,000 dwt and 40,000 dwt if retrofitting is not, in the opinion of the Administration, reasonable and practicable).

(iii) All existing tankers of 20,000 dwt and above where high capacity washing machines (60 cubic meters per hours and above) are fitted.

(iv) All tankers where COW is fitted.

Inert gas systems are required within two years of the SOLAS Protocol entering into force for tankers of 70,000 dwt and above, and after a further period of two years for crude oil carriers fo 20,000 dwt and above, and product tankers of 40,000 dwt and above. Inert gas systems are mandatory when COW is fitted.

5. *Steering gear.* Requirements were formulated relating to control, communication, and local operation of steering gear for new and existing vessels. In addition, procedures and drills covering the operation and testing of steering gear at stipulated intervals were developed.

The new requirements provide that:

(i) All tankers of 10,000 gross tons (gt) and above have two remote steering gear control systems, each operable separately from the navigating bridge.

(ii) The main steering gear of new tankers of 10,000 gt and above comprise two or more identical power units, and be capable of operating the rudder while operating with one or more power units.

6. *Radar and Collision Avoidance Aids.* The Conference agreed that all ships between 1,600 and 10,000 gross tons be fitted with radar, while all ships of 10,000 gt and above must have two radars, each capable of operating independently of the other, on the date the SOLAS Protocol enters into force. It was also resolved that performance standards for collision avoidance aids, and requirements for their carriage on all ships of 10,000 gt and above, be developed by IMCO as a matter of urgency, and not later than July 1, 1979.

INSPECTIONS AND CERTIFICATION

The requirements of the existing Conventions were examined, strengthened and new arrangements formulated where necessary. The main changes, in summary, are:

(1) In addition to the periodical surveys specified in the SOLAS 1974 Convention, Administrations must institute unscheduled inspections of all ships unless mandatory annual surveys are carried out.

(2) New procedures were developed which must be followed when defects are found during unscheduled inspections.

(3) Administrations will be required to provide a clearer delineation of the authority they delegate to non-governmental bodies to act on their behalf.

(4) The SOLAS 1974 Convention requires surveys for Safety Equipment Certificates to be carried out every two years. A requirement for an annual survey for tankers of 10 years of age and over was added.

(5) The 1974 SOLAS Convention does not specify a period of validity for Cargo Ship Safety Construction Certificates. Under the SOLAS Protocol, these Certificates will have a maximum period of validity of 5 years. In addition there will be a requirement for an intermediate Cargo Ship Safety Construction Certificate survey for tankers of 10 years of age and over.

(6) The Cargo Ship Safety Construction Certificate survey requirements have been extended to include the cargo pumping, piping, and venting arrangements.

(7) The obligation to maintain ships and their equipment in a satisfactory condition between surveys has been more clearly defined.

(8) More explicit requirements for reporting accidents and deficiencies and the manner in which Administrations are required to act on this information have been adopted.

PROCEDURAL ARRANGEMENTS

The procedural arrangements for bringing the SOLAS Convention and its Protocol and the MARPOL Protocol into force were based on the need to ensure that their safety and pollution prevention requirements were implemented at the earliest possible time.

In the case of the safety provisions extending the requirements of the SOLAS 1974 Convention, a Protocol was developed to come into force either at the same time as the parent Convention, or as soon as possible thereafter. The reason for this procedure was the expectation that the SOLAS 1974 Convention would probably enter into force in June 1979 as 10 countries having about 40 percent of the world's gross tonnage of merchant shipping have already ratified that Convention. The Protocol to the SOLAS 1974 Convention will come into force 6 months after being accepted by 15 States whose combined fleets total at least 50 percent of the world's gross tonnage of merchant shipping. The Conference recommended that all Governments concerned adopt a target date of June 1979 for entry into force of the SOLAS Convention and endeavor to ensure that the SOLAS Protocol enters into force at the same time or as soon as possible thereafter.

On the other hand, the Protocol to the MARPOL 1973 Convention was merged with its parent Convention. Because of technical problems associated with implementation of Annex II (Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk) of the Convention (chiefly the required treatment and disposal of chemical tank washings) the conference agreed to delay for 3 years after the entry into force of the Protocol the effective date for Annex II. This will allow countries to accept the Protocol enabling Annex I (Regulations for the Prevention of Pollution by Oil) to be effective at an early date while allowing technological development to proceed to enable implementation of Annex II. the MARPOL Protocol (which incorporates the basic 73 Convention) will enter into force a year after being accepted by 15 States whose combined fleets total at least 50 percent of the world's gross tonnage. The target date for entry into force of the MARPOL Protocol is June 1981.

In addition to the preparation of Protocols to the Convention, the conference adopted a number of important Resolutions on a wide range of topics covering future action by the Organization and Governments. These Resolutions included action on: Establishment of a Marine Safety Corps to assist Administrations having an inadequate reserve of experienced personnel to undertake surveys of ships in accordance with international conventions: Implementation of Conventions; Control of Discharges from Ships; Improvement of Steering Gear Standards; Shipborne Navigation Equipment; Protection of Sensitive Sea Areas; Future Developments Aimed at Eliminating Pollution; Development of International Standards for: Inert Gas Systems, clean Ballast Tank Operation, and Crude Oil Washing Systems.

IMPLEMENTATION

The agreements reached at the Conference were developed with a sense of urgency as well as with a desire for rapid implementation. The Coast Guard has prepared a plan to implement the agreements reached in a rapid and timely manner. The Administrative Procedure Act, as well as executive branch directives concerning regulatory development, specify minimum amounts of time necessary for the regulatory process.

These guidelines have been observed in the development of the plan which provides a conservative estimate of the time frame envisioned. The implementation plan addresses the Coat Guard's action with respect to changes required in appropriate sections of the Code of Federal Regulations.

NEW SHIPS AND EXISTING SHIPS

Where the fitting of SBT, COW, and IGS is required for new ships; new ships are defined by the following sets of dates: (1) Vessels which have a contract date after June 1, 1979; (2) vessels which have their keel laid after January 1, 1980; (3) vessels which are delivered after June 1, 1982. Existing ships for the purposes of the Protocols are all ships that are not new ships.

Specific regulatory proposals which describe the measures adopted by the Conference will be the subject of future notices of proposed rulemaking. Public comment will be solicited at that time.

IMPLEMENTATION DATES

It is the intention of the Coast Guard to utilize the implementation dates developed by the Conference. These dates as indicated in Table 1 range from June 1979 through June 1985. Table 2, which illustrates the plan for implementation, indicates publication of rules in February 1979. This does not mean that this is the time at which vessels must comply, but rather it will set out the required times through June 1985 when specific construction measures must be fitted.

EXPLANATION OF TERMS USED IN TABLE 1

CAA—Collision avoidance aids; performance standards are to be developed by July 1, 1979. SOLAS 74, chapter V, will then be amended to require CAA on all ships of 10,000 GT and over at a time to be agreed upon.

CBT—Dedicated clean ballast tanks. Existing tankers may operate with dedicated clean ballast tanks in accordance with the requirements of regulation 13 and 13A of the MARPOL Protocol, and the specifications in resolution 14.

COW—Crude oil washing, to comply with the requirements of regulation 13 and 13B of the MARPOL Protocol and the specifications in resolution 15.

DWT—Deadweight Tonnage, the difference in metric tons between the displacement of a ship in water (specific gravity of 1.027) at the load waterline corresponding to the assigned summer freeboard, and the displacement of a ship in metric tons without cargo, fuel oil, lubricating oil, ballast water, fresh water, and feedwater in tanks, consumable stores, passengers and their effects.

GT—Gross Tonnage is the total measured cubic volume of a ship expressed in units of 100 cu. ft. with certain space exemptions.

HM—Date of entry into force of MARPOL Protocol (which incorporates the MARPOL 73 Convention). Target date of June 1981 was established by resolution 1. Dates in parentheses in Table 1 are dates by which resolution 1 and 2 recommended putting these requirements into effect, without waiting for the Protocols to enter into force.

HS—Date of entry into force of SOLAS Protocol. Target date of June 1979 was established by resolution 2. Dates in parentheses in Table 1 are dates by which resolutions 1 and 2 recommend putting these requirements into effect, without waiting for entry into force of the Protocols.

IGS—Inert gas system, to comply with the SOLAS Protocol, chapter II-2, regulations 55 and 60.

PL—Protective location of segregated ballast tanks to provide protection of cargo spaces in case of collision or grounding, to comply with MARPOL Protocol, regulation 13E.

SBT—Segregated ballast tanks, to comply with the MARPOL Protocol, regulation 13.

Second Radar—Requirement for at least two radars, each capable of operating independently of the other. SOLAS Protocol, chapter V, regulation 12.

Steering—Improvements to steering gear and steering gear control system requirements contained in SOLAS Protocol, chapter II-1, regulations 2 and 29, and changes to operating requirements (use of automatic pilot, steering testing and drills, etc.), in chapter V, regulations 19, 19-1, and 19-2. "Date required" given for existing tankers applies to modifications to steering gear, operating requirements may come into effect earlier.

Table 1

TANKER SAFETY AND POLLUTION PREVENTION CONFERENCE RESULTS

Ship Construction and Equipment Requirements

Tank Vessel		Requirement (Construction feature, vessel tonnage, Date required)	
New Vessels Determining Dates 6/79 Contract date 1/80 Keel Laying 6/82 Delivery	Crude Oil	FL / SBT COW IGS	20,000 DWT and over (Note 1)
		Second Radar CAA Steering	10,000 GT and over at MS (6/79)
	Petroleum Products	FL / SBT	30,000 DWT and over
		IGS	20,000 DWT and over
		Second Radar CAA Steering	10,000 GT and over at MS (6/79)
Existing Vessels	Crude Oil	CBT or SBT or COW	40,000 DWT and over at MM (6/81) — then → SBT or COW: 70,000 DWT and over at MM+2 (6/83); 40,000 to 70,000 DWT at MM+4 (6/85)
		IGS	70,000 DWT and over at MS+2 (6/81) 20,000 to 70,000 DWT at MS+4 (6/83) (Note 2)
		Second Radar CAA	10,000 GT and over at MS (6/79)
		Steering	10,000 GT and over at MS+2 (6/81)
	Petroleum Products	CBT or SBT	40,000 DWT and over at MM (6/81)
		IGS	70,000 DWT and over at MS+2 (6/81) 40,000 to 70,000 DWT at MS+4 (6/83) (Note 3)
		Second Radar CAA	10,000 GT and over at MS (6/79)
		Steering	10,000 GT and over at MS+2 (6/81)

Note: Dates in ( ) are dates by which Resolutions 1 and 2 adopted by the Conference recommended putting these requirements into effect, without waiting for entry into force of the Protocols.

Footnotes:

1. An inert gas system (IGS) is required whenever a tanker uses crude oil washing.

2. Between 20,000 and 40,000 DWT, the Administration of a Flag State may grant an exemption to the requirements for IGS if high capacity washing machines (i.e., tank washing machines having an individual throughput of greater than 60 cubic meters per hour) are not fitted and the ship's design characteristics make it impracticable to fit IGS.

3. Tonnage limit for IGS is to be reduced to 20,000 DWT if tank washing machines having an individual throughput of greater than 60 cubic meters per hour are fitted.

TABLE 2

COAST GUARD IMPLEMENTATION PLAN FOR TSPP RESULTS

▲ Issue NPRM

● Issue Final Rules

1979

APRIL | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC | JAN | FEB | MAR

REQUIREMENTS		EFFECTIVE DATES New	EFFECTIVE DATES Existing
Segregated Ballast Tanks (SBT), Clean Ballast Tanks (CBT), Crude Oil Washing (COW)	Prep. of proposed rules & regulatory analysis; Adm. Rev. ▲; Public Comments & Hearings; Prep. of final rules; Adm. Rev ●	Crude: 6/79-Contract date; 1/80-Keel laying; or; Product: 6/82-Delivery	6/81-CBT, SBT, or COW for 40,000 DWT or over, then 6/83-SBT or COW for 70,000 DWT or over, then 6/85-SBT or COW-40-70,000 DW Product - 6/81-CBT or SBT for 40,000 DWT or over
Inert Gas Systems (IGS)	Prep. of final rules; Admin. Review ●	Crude: 6/79-Contract date; 1/80-Keel laying; or; Product: 6/82-Delivery	Crude - 6/81 70,000 DWT or over - 6/83 20-70,000 DWT Product - 6/81 70,000 DWT or over - 6/83 40-70,000 DWT
Improved Steering Standards	Prep. of proposed rules & regulatory analysis; Adm. Rev. ▲; Public Comments & Hearings; Prep. of final rules; Adm. Rev. ●	Crude - 6/79; Product - 6/79	Crude - 6/81; Product - 6/81
Second Radar System	Prep. of final rules; Admin. Review ●	Crude - 6/79; Product - 6/79	Crude - 6/79; Product - 6/79
Collision Avoidance Assistance Equipment	Prop. rules pub. 5/17/77 will be withdrawn. Withdrawal notice will explain reasons & solicit comments on procedure to insure full U.S. participation in IMCO CAA spec. development. Withdrawal of prop. rules	IMCO to develop performance standards for CAA not later than 1 July 1979. C.G. will participate in IMCO proceedings based on receipt of solicited comments.	
Improved Inspection and Certification Requirements	CG reviewing internal directives and guidelines applicable to inspection and certification of all U.S. flag ships to ensure requirements meet or exceed the inspection and certification provisions of the 1978 Protocols to MARPOL 73 and SOLAS 74. Foreign flag vessels to be examined annually under tanker boarding and inspection program		

Dated: April 11, 1978.

W. M. BENKERT,
Rear Admiral, U.S. Coast Guard,
Chief, Office of Merchant
Marine Safety.

[FR Doc. 78-10297 Filed 4-19-78; 8:45 am]

APPENDIX 2

federal register

MONDAY, JULY 24, 1978
PART VIII



DEPARTMENT OF TRANSPORTATION

Coast Guard

■

NAVIGATION SAFETY REGULATIONS

Additional Equipment for Vessels of 10,000 Gross Tons or More

[4910-14]

Title 33—Navigation and Navigable Waters

CHAPTER I—COAST GUARD, DEPARTMENT OF TRANSPORTATION

[CGD 77-016]

PART 164—NAVIGATION SAFETY REGULATIONS

Additional Equipment for Vessels of 10,000 Gross Tons or More

AGENCY: Coast Guard, DOT.

ACTION: Final rule; withdrawal of proposed rule.

SUMMARY: This document amends the navigation safety regulations by requiring vessels of 10,000 gross tons or more to carry an additional marine radar system. It also withdraws the proposal to require collision avoidance equipment on those vessels. The second radar requirement will provide both redundancy and flexibility in the navigation of large vessels, thereby improving the safety of their navigation.

EFFECTIVE DATE: This amendment is effective on June 1, 1979.

FOR FURTHER INFORMATION CONTACT:

Captain George K. Greiner, Marine Safety Council (G-CMC/81), Room 8117, Department of Transportation, Nassif Building, 400 Seventh Street SW., Washington, D.C. 20590, 202-426-1477.

SUPPLEMENTARY INFORMATION: A notice of proposed rulemaking on these subjects was published on May 16, 1977 (42 FR 24871). Interested persons were given until September 1, 1977 to submit comments. The comment period subsequently was extended to November 15, 1977 at the request of several interested persons. Public hearings were held in San Diego, Calif., on June 16, 1977 and in Washington, D.C., on June 21, 1977.

This rulemaking is consistent with the intent of President Carter's March 17, 1977, message to Congress in which he directed the Secretary of Transportation to proceed with both proposals. The President recognized that pollution is a global problem and that international action is the best solution. He therefore allowed 5 years for his proposals to be considered and acted upon. Given the existing climate of international agreement on the second radar and in view of the ongoing negotiations concerning collision avoidance aids, it is expected that both matters will be resolved within that time.

Drafting Information

The principal persons involved in drafting this rule are Mr. Fred Schwer, Project Manager, Office of Marine Environment and Systems, and Mr. Stanley Colby, Project Attorney, Office of Chief Counsel.

Withdrawal of Proposal to Require Collision Avoidance (CA) Aids

Responses to the notice of proposed rulemaking were split nearly evenly, pro and con on the subject of CA aids. Eighty-eight favorable comments were received, 76 of which were from private citizens expressing general concern for the environment and 12 of which were from directly interested parties, such as ship owners, CA manufacturers, and other Government agencies. Eighty-five commenters objected to or suggested various changes in the proposal.

The 1978 Tanker Safety and Pollution Prevention Conference, a plenipotentiary ministerial conference including 62 nations and 17 international organizations, was held in London from February 6 to 18, 1978. The Conference adopted the second radar requirement as an international standard, but deferred action on CA aids. Instead, the Conference requested the Intergovernmental Maritime Consultative Organization (IMCO), a U.N. agency, to "• • • develop performance standards for collision avoidance aids as a matter of urgency and not later than July 1, 1979." The Conference further requested IMCO to prepare requirements for the carriage of CA aids and to develop a training program for instruction in the use of the aids.

In view of the responses to the notice of proposed rulemaking and in light of the actions of the recent Tanker Conference, the Coast Guard is withdrawing the proposal in CGD 77-016 that would require CA aids. Coast Guard representatives will participate in the IMCO proceedings and will reevaluate the need for a U.S. rulemaking on the requirement for CA aids when the international body has completed its work. Persons wishing to contribute to U.S. participation in the IMCO discussions may contact Captain Greiner for further information.

Discussion of Major Comments Concerning Second Radar

Ninety-five letters of comment supporting the requirement of a second radar system on large vessels were received. They included 76 letters of environmentally motivated general support as well as letters from pilots, ship owners, manufacturers, State and Federal agencies and others. Four correspondents suggested that the decision to install a second radar system would be better left to the ship owner. They pointed out that some vessels are dedicated to service in areas that rarely have poor visibility or heavy vessel traffic. One other commenter recommended that mobile offshore drilling units be excluded from the requirement.

The Coast Guard does not agree with either of these suggestions. Radar is a time tested and proven aid for navigation and collision avoidance. Self-propelled vessels of 10,000 gross tons and larger should not be left handicapped and possibly endangered by the failure of their primary radar. Moreover, a second working radar adds an element of flexibility in radar use that can enhance safe navigation.

The 1978 Tanker Safety Conference concurred in the value of a second radar system for large vessels. The Conference adopted a protocol with a change to chapter V, regulation 12, of the International Convention for the Safety of Life at Sea, 1974 (SOLAS '74), which will require "all ships of 10,000 tons gross tonnage and upwards [to] be fitted with two radars, each capable of operating independently of the other." The SOLAS '74 Convention is before the U.S. Senate for its advice and consent. The protocol will be submitted to the U.S. Senate when the official text has been received. The June 1, 1979, effective date for this regulation is in accordance with international commitments made at the Tanker Safety Conference.

There has been some discussion about the meaning of the phrase "• • • each capable of operating independently of the other." The intent is to require two completely separate systems, including antenna, waveguides, consoles, etc., and a separate branch power supply circuit, so that a failure of any system component will not disable both systems. This is consistent with the intent of the Coast Guard proposal [as discussed in the May 16th notice], for without discrete systems there is no redundancy.

In consideration of the foregoing, part 164 of chapter I, title 33, Code of Federal Regulations is amended by adding new § 164.37 to read as follows:

§ 164.37 Equipment: Vessels of 10,000 gross tons or more.

Each vessel of 10,000 gross tons or more must have, in addition to the radar system under § 164.35(a), a second marine radar system that operates independently of the first.

NOTE.—Independent operation means two completely separate systems, from separate branch power supply circuits or distribution panels to antennas, so that failure of any component of one system will not render the other system inoperative.

(Titles I and II, 86 Stat. 426, 427 (33 U.S.C. 1224; 46 U.S.C. 391a); 49 CFR 1.46(n)(4).)

NOTE.—The Coast Guard has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended, and OMB Circular A-107.

J. B. HAYES,
Admiral, U.S. Coast Guard
Commandant.

JULY 19, 1978.

(FR Doc. 78-20487 Filed 7-21-78; 8:45 am)

Appendix 3

Rulemaking Activity Related to the Ports and Waterways Safety Act of 1972

I. Final Rules Published in 1978:

1. Navigation Safety Regulations (Second Radar) (77-016)	July 24, 1978
2. Mobile Offshore Drilling Units (73-251)	Dec. 4, 1978

II. Published Notices of Proposed Rulemaking Still Being Developed as Rules:

1. Tanker Safety and Pollution Prevention - Information and Regulatory Implementation Plan (78-053)	Apr. 20, 1978
2. Inert Gas Systems for Tankers (77-057)	May 16, 1978
3. Standards of Training and Certification of Seafarers (78-100)	July 31, 1978
4. Benzene Carriage Requirements (75-075)	Aug. 21, 1978
5. Tanker Safety and Pollution Prevention Schedule (77-053a)	Sep. 21, 1978
6. Tankerman Certification (74-044)	Apr. 25, 1977
7. Tank Vessel Manual of Operations (75-148)	May 9, 1977
8. Emergency Steering Systems (77-063)	May 16, 1977
9. Double Bottoms and Segregated Ballast for Tankers (77-058)	May 16, 1977
10. Firehouse Nozzle Requirements (76-086)	June 17, 1977
11. Revisions to the Electrical Requirements (74-125)	June 27, 1977
12. Oil Pollution Prevention, Vessel and Oil Transfer Facilities (75-124)	June 27, 1977
13. Tank Vessel Carrying Oil Bulk Cargo Monitors (76-886)	June 27, 1977
14. Oil Pollution Prevention Equipment, Specifications (76-882)	June 27, 1977

15. Vessels Carrying Bulk Liquid Gases (77-069)	June 30, 1977
16. Electronic Navigation (77-168)	Nov. 14, 1977
17. Standards for Liquefied Gas Carriers (74-289)	Oct. 4, 1976

APPENDIX 4

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

notices

MAILING ADDRESS:
U.S. COAST GUARD (G-MVP/82)
WASHINGTON, D.C. 20590
PHONE: (202)426-1500

16720-1.1/STW
2 August 1978

•The following notice is for information and to assist in answering inquiries from the public on the International Conference on Training and Certification of Seafarers, 1978.

DEPARTMENT OF TRANSPORTATION

Coast Guard

[CGD 78-169]

STANDARDS OF TRAINING AND CERTIFICATION OF SEAFARERS

Information and Regulatory Implementation Notice

PURPOSE

The purpose of this Notice is to inform the public of the results of the International Conference on Training and Certification of Seafarers, 1978 (held under the auspices of the Intergovermental Maritime Consultative Organization (IMCO) in association with the International Labor Organization (ILO) from June 14 through July 7, 1978); and, to provide notice to the public of the Coast Guard's intent to formulate proposals for regulatory implementation of the results of the Conference in the near future.

BACKGROUND

In early 1970 an IMCO working group reported "that in view of the continuing alarming rise in maritime casualties and pollution, it is necessary for urgent action to be taken, aimed at strengthening and improving standards and professional qualifications of mariners, as a means of securing better guarantees of safety at sea and protection of the marine environment."

Accordingly, at its 24th session (October 1971) the IMCO Maritime Safety Committee established the Subcommittee on Standards of Training and Watchkeeping and tasked it with studying the subject, and preparing a position to be considered at the Joint IMCO/ILO Committee on Training or, as appropriate, in conjunction with other members of the U.N. family. This subcommittee met once in 1972 and twice a year thereafter and produced a draft Convention for consideration by this 1978 Conference.

During the winter of 1976-77, several tanker casualties occurred in or near U.S. waters which demonstrated a need for an international effort to improve the level of safety on tank vessels and to decrease their pollution potential.

President Carter, in a March 17, 1977, message to Congress, proposed a series of initiatives on tank vessel safety and pollution prevention which should be taken nationally and internationally. The initiatives were broad in scope and covered three major areas:

1. Improved vessel inspection and certification.
2. Improved crew standards.
3. Improved vessel construction and equipment standards.

Improved vessel inspection and certification standards and procedures, as well as improved construction and equipment standards, were addressed by the International Conference on Tanker Safety and Pollution Prevention, February 6-17, 1978, under IMCO auspices. (See FR dated April 20, 1978, Part II, page 16886)

The improvement of crew standards was the subject of the International Conference on Training and Certification of Seafarers, 1978. Originally scheduled for the end of 1978, the Conference date was advanced to June-July at the request of the United States as part of this initiative on tank vessel safety and pollution prevention. The mission of the Conference was to work for a strong and effective Convention capable of early ratification by all nations so that it might come into force as early as possible.

Individuals or parties interested in full details of the June-July Conference may obtain further documentation from the Coast Guard. A document has been prepared for distribution containing the Final Act of the Conference and Attachment 1 thereto, the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978. Every effort has been made to ensure its accuracy; however, the official documents from IMCO will not be available for some time to allow for translation into five official languages.

A copy of the Final Act of the Conference may be obtained by writing: Commandant (G-MVP/82), U.S. Coast Guard, Washington, D.C. 20590.

CONFERENCE ON TRAINING AND CERTIFICATION OF SEAFARERS, 1978

SUMMARY OF AGREED MEASURES

At the Conference, 72 nations agreed on the text of the world's first International Convention establishing basic requirements on training, certification and watchkeeping for masters, officers and crews of "seagoing" merchant ships. This Convention does not apply to war ships, naval auxiliaries, or other government-owned ships in governmental noncommerical service, nor does it apply to fishing vessels or yachts.

The new treaty, the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, has the stated purpose: "To promote safety of life and property at sea and the protection of the marine environment." Based on the official assumption that human error in some aspects is a contributing factor in over 80 percent of maritime accidents, the improved training and qualification standards, when implemented, should better qualify personnel on board ships to avoid maritime casualties.

The principal provisions in the articles of the convention pertain to the issuance of certificates to seafarers and to the exercise of control with respect to such certificates on all ships when in the ports of a party to the Convention. Existing certificates and those issued under national practice to seafarers who commenced their sea service before the entry into force of the Convention will continue to be recognized. Under very limited and specific conditions a dispensation, to permit a seafarer to serve in a capacity for which he does not hold the appropriate certificate, may be granted in circumstances of an exceptional necessity. However, dispensations will not be granted to masters and chief engineers except in cases of extreme emergency. The control procedures will enable an administration to ascertain that seafarers on ships arriving in their ports comply with the Convention. In cases of noncompliance with the provisions of this Convention, in regard to failure of seafarers required to hold a certificate to have an appropriate valid certificate or valid dispensation, or, failure of navigational or engineering watch arrangements to conform to the requirements specified for the ship by the flag state, a ship may be detained.

The Annex to the Convention contains the regulations which establish standards for certificating masters, deck and engineer officers, and for issuing authorized documents to unlicensed ratings in the deck department. Requirements for sea service, training, professional examination, and physical fitness were incorporated to ensure that the level of qualification for seafarers is uniformly attained in all countries. Additionally, requirements were established in regard to the training and qualification of masters, officers and ratings for oil, chemical and liquefied gas tankers. These latter provisions were adopted by the Conference largely as a result of a resolution adopted by the February 1978, Conference on Tanker Safety and Pollution Prevention.

The Conference also adopted 23 resolutions which reinforce the Convention by recommending additional procedures and inviting further development of appropriate training requirements by the organization. Although the 23 resolutions adopted at this Conference do not form a part of the convention, being recommendations only, the United States will be considering implementing certain provisions of these resolutions, where desirable.

The Convention will enter into force 12 months after 25 nations, with combined merchant fleets constituting 50 percent of the gross tonnage of the world's merchant shipping, have either signed without reservation or deposited an instrument of ratification, acceptance, accession, or approval. The effect of its benefits may be realised much sooner since many of the more established maritime nations, which have already evolved standards comparable to the Convention requirements, intend to work toward implementing the provisions before the Convention comes into force.

IMPLEMENTATION

The Coast Guard intends, at a later date, to publish proposed rules for implementation of specific provisions of the Convention, as well as the desirable portions of the resolutions adopted by the Conference, which would call for higher standards than are presently required by U.S. rules and regulations for licensing of merchant marine personnel. Public comments will be invited at that time.

Dated: July 21, 1978.

W. M. BENKERT,
Rear Admiral, U.S. Coast Guard, Chief, Office of Merchant Marine Safety.

[FR Doc. 78-21125 Filed 7-28-78; 8:45 am]

U.S. DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD
Washington, D.C. 20590

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APPENDIX 5

1978 AMERICAN PETROLEUM INSTITUTE

TANKER CONFERENCE

2 OCTOBER 1978

INNISBROOK, TARPON SPRINGS, FLORIDA

A DESCRIPTION OF THE USCG FOREIGN TANK VESSEL EXAMINATION PROGRAM AND AN ANALYSIS OF THE RESULTS OF THAT PROGRAM FROM JANUARY 1977 THRU JUNE 1978

As a prelude to the discussion of the Foreign Tank Vessel Examination Program, it is important to realize that there is a great deal of difference in the scope of involvement and control that the U. S. Coast Guard exerts over U. S. flag tankers vs. that of the foreign flag tanker calling at a U. S. port. From the initial review of its plans before construction until it is scrapped or sold to a foreign owner, the U. S. flag tanker has continuous involvement with the U. S. Coast Guard to insure that it is in compliance with applicable Federal regulations and international agreements. A foreign flag tanker, on the other hand, having the necessary certificates and being from a nation signatory to the international convention for vessel safety is largely exempt from domestic regulation. The primary exceptions to this are those vessels required to obtain a Letter of Compliance for the carriage of hazardous cargoes in bulk and those vessels examined for cause, such as involvement in a vessel casualty in U. S. waters. While there are other reasons for U. S. Coast Guard involvement with a foreign flag tanker such as examination for compliance with the pollution prevention regulations and navigation safety regulations, essentially, from the standpoint of the Commercial Vessel Safety Program, reoccurring examinations of a foreign flag vessel was out of the ordinary. That state of affairs changed dramatically during the winter of 1976-1977.

The present expanded Foreign Tank Vessel Examination Program was born on the evening of 17 December 1976 in Los Angeles Harbor with the explosion of the SS SANSINENA, resulting in six deaths plus three missing and presumed dead, injuries to 58 persons, release of approximately 20,000 gallons of bunker oil into the harbor, and loss of a vessel valued at twenty-one point six (21.6) million dollars.

This casualty was one of a number of tragic incidents that began two days earlier (15 December) with the grounding of the tank vessel ARGO MERCHANT twenty-eight (28) miles southeast of Nantucket Island, resulting in the spill of 7.3 million gallons of #6 fuel oil and the loss of the vessel. These two casualties were quickly followed by a pollution incident involving the tank vessel OSWEGO PEACE, wherein 5,000 gallons of bunker oil leaked through the skin of a tank into the Thames River in New London, Conn. on 24 December; the grounding of the tank vessel OLYMPIC GAMES in the Delaware River on 27 December, resulting in the spill of 133,000 gallons of crude oil with no loss of life; the grounding of the fully loaded ore/oil carrier SS DAPHNE while approaching a harbor in Puerto Rico on 28 December; the explosion and fire on board the ore/oil carrier SS MARY ANN on 1 January in the Atlantic Ocean, resulting in injuries to two crewmembers; the disappearance of the fully loaded (8.2 million gallons of #6 oil) tank vessel GRAND ZENITH with her entire crew in the North Atlantic Ocean enroute Providence, R. I. around 2 January 1977; the grounding on 4 January 1977 of the tank vessel UNIVERSE LEADER in the Delaware River with no loss of cargo; the loss of the coastwise U. S. tank vessel CHESTER A. POLING on 10 January due to structural failure in the Atlantic Ocean with the loss of one life; the loss of the tank vessel IRENES CHALLENGER in the North Pacific Ocean on 17 January with three crewmembers missing; the explosion of the tank vessel EXXON SAN FRANCISCO while in a U. S. port on 27 January with the loss of three lives; the striking of the Hopewell Bridge in Virginia on 24 February 1977 by the U. S. flag commercial carrier SS MARINE FLORIDIAN as a result of a steering gear malfunction; and the explosion of the tank vessel CLAUDE

CONWAY in the Atlantic Ocean on 27 March 1977, resulting in the loss of twelve lives and the vessel itself.

The U. S. Coast Guard, in response to conditions found by the SS SANSINENA Marine Board of Investigation, on 21 January 1977 issued a Commandant Notice to marine safety offices and marine inspection offices to immediately assign qualified marine inspectors to examine the cargo venting and handling systems of foreign flag tankships calling at U. S. ports. Subsequent detailed guidelines were issued in amplification of the original order detailing the goal of the program and outlining the scope and philosophy for conducting the examinations.

These guidelines require that each foreign flag tank vessel shall be examined at least annually with re-examinations conducted as necessary to ensure the correction of outstanding deficiencies. The scope of the examination ensures that each foreign flag tank vessel entering U. S. waters is in compliance with the general safety control provisions of SOLAS 60, the applicable International Load Line Convention (1930 or 1966) and with all applicable U. S. regulations. Each full examination is conducted by at least two U. S. Coast Guard inspectors (normally, a qualified Marine Inspector and a qualified Dangerous Cargoman/Pollution Investigator).

Deficiencies required to be corrected (temporarily or permanently) while a tank vessel is in a U. S. port are those that pose an imminent threat to the safety of the port, crew, vessel or environment. Depending upon the nature of the deficiency, correction may be required prior to cargo transfer, or cargo transfer may be allowed to proceed with corrective

action being required prior to the vessel's departure. The Officer in Charge, Marine Inspection (OCMI) indicates the date (month/year) by which a deficiency should be permanently corrected. In making this determination, every effort is made to consult with the master to ensure a reasonable and equitable time period is allotted. However, the maximum time period allowed for permanent correction of any deficiency may not exceed one year.

Deficiencies required to be permanently corrected prior to a tank vessel re-entering a U. S. port are those that have been allotted a specific time period to affect permanent repairs. A vessel with a deficiency on record must be boarded at the first U. S. port of call after the expiration date for correction of that deficiency. Depending upon the nature of the deficiency, consideration is given to conducting this boarding at anchorage or at the sea buoy rather than at the transfer terminal. If permanent repairs have not been completed within the allotted time period, a re-evaluation of the temporary repair is made and this could result in an extension of the time limit for permanently correcting the deficiency. Essentially, these are the same procedures that are observed for U. S. flag vessels given similar circumstances.

In the event an extension of the time period for permanent repair is not granted, the vessel must be denied entry or detained. The Tank Vessel Act (46 USC 391a) provides authority to deny entry into the navigable waters of the U. S. to a tankship which is not in compliance with applicable provisions of the Act or regulations issued thereunder. The USCG Captain of the Port (COTP) has been delegated this authority by 33 CFR 160.37 and may exercise the authority when non-compliance constitutes a hazard to the environment or the safety of the port. When a COTP determines a vessel is

not in compliance with applicable regulations, he will notify the Master or Agent that vessel entry into U. S. navigable waters is denied until the vessel complies with the applicable regulations. However, the COTP only uses this authority when he is satisfied that the vessel, if not in compliance, would constitute a hazard to the environment or the safety of the port. In making such a determination, he fully weighs the possible result of denial of entry to the safety of the vessel's crew. The Ports and Waterways Safety Act and 33 CFR 160.35 provide authority for the COTP to direct, control or restrict the movement of any vessel in the navigable waters of the U. S. for safety reasons. The Act also provides the authority for a COTP to order a vessel to depart U. S. waters when a hazardous condition results from non-compliance with applicable regulations. This authority provides the COTP with an effective tool to direct, control or restrict the movements of a foreign flag tank vessel when hazardous circumstances exist. The hazardous circumstance is always weighed against the welfare of the vessel's crew in exercising this authority.

Regulation 19 of Chapter I, SOLAS 60 authorizes enforcement officers of parties to SOLAS to intervene in cases where the condition of a ship subject to SOLAS may present a danger to the passengers or crew of the ship if it is permitted to sail. OCMI's do not hesitate to intervene in cases where a foreign flag vessel subject to SOLAS is not materially in compliance with its SOLAS certificates so as to pose a threat to the vessel's passengers or crew if it is permitted to depart.

In those cases where foreign flag tank vessels are found to have deficiencies which are violations of applicable U. S. regulations, all reasonable

efforts are made to require permanent correction of the deficiencies immediately. Those deficiencies not required to be permanently corrected immediately are appropriately recorded on the Tank Vessel Examination Letter. All foreign flag tank vessels which have been previously examined and subsequently are found not to be in compliance with applicable U. S. regulations, after either being in compliance at a previous examination or after expiration of any permitted delay in correction, are cited.

Regulation 13 of Chapter V of SOLAS 60 imposes an obligation on parties to SOLAS to ensure that ships of their nationality are sufficiently and efficiently manned from the point of view of safety of life at sea. While there are at present no precise manning standards which may be applied to foreign flag tank vessels in all situations, the following general guidelines are observed by the U. S. Coast Guard regarding manning to ensure that operations and movements in U. S. waters are conducted safely. Normally, no foreign flag tank vessel of more than 1600 gross tons entering U. S. ports should be manned with fewer than the following complement of licensed officers: One Master, two Mates, one Chief Engineer and one Assistant Engineer. All licenses must be current and appropriate as to route, tonnage, horsepower, etc., and must have been issued by the administration of the country of vessel registry or by a nation signatory to the SOLAS 60 Convention. A vessel manned other than in accordance with these guidelines need not in every case be subjected to restrictions upon its operations or its movements; however, care is exercised to ensure that any proposed operation or movement can be safely conducted. If, in the judgement of an examining officer, a proposed operation or movement cannot be safely conducted without some change in the vessel's manning, consideration is given to imposition of restrictions under 33 CFR Part 160 and related regulations.

The normal operational procedure for U. S. Coast Guard control of foreign flag tank vessels entering the navigable waters of the U. S. is as follows:

Master or Agent must provide vessel 24 hour advance notice of vessel arrival to Captain of the Port (COTP) (required by 33 CFR Part 124)

Captain of the Port and/or Officer in Charge, Marine Inspection (OCMI) Query of Interim Marine Safety Information System for possible past history of vessel which may include: (a) history of violation of U. S. safety and environmental protection regulations, (b) history of pollution incidents in U. S. waters, (c) history of Coast Guard boardings and examinations, (d) history of casualty data.

Based upon available information, a decision is made concerning each tank vessel entry by COTP and OCMI or CO MSO.

Boarding Unnecessary

No further Coast Guard action this vessel entry

Enter fact in Interim MSIS

Boarding Necessary

COTP dispatch (one) qualified Coast Guard dangerous cargoman/ pollution investigator to Monitor cargo transfer operation for safety and compliance with U. S. Pollution Prevention Regulation

Enter results in Interim MSIS

Boarding and Examination Necessary

OCMI and COTP dispatch (o qualified Coast Guard Ma Inspector and (one) qual fied Coast Guard dangero cargoman/pollution inves gator to conduct foreign tank vessel examination accordance with Commanda Instruction 16711.4 date 16 February 1978 and to monitor cargo transfer operation

Enter results in Interi MSIS, issue letter of m stating examination re forward copy of letter Coast Guard Headquarter Merchant Vessel Inspect Division (G-MVI).

Boarding and Examination Necessary (Con't.)

Letters coded and filed by G-MVI following entry of coded data into automated file for later analysis. Letters are utilized as the basis for the ongoing analysis of the foreign tank vessel examination program and to provide copies to foreign governments on request.

Results of program analysis are utilized to provide data for:

a. Measuring program effectiveness

b. Testimony before Congressional subcommittees

c. Response to Congressional and Departmental inquiries

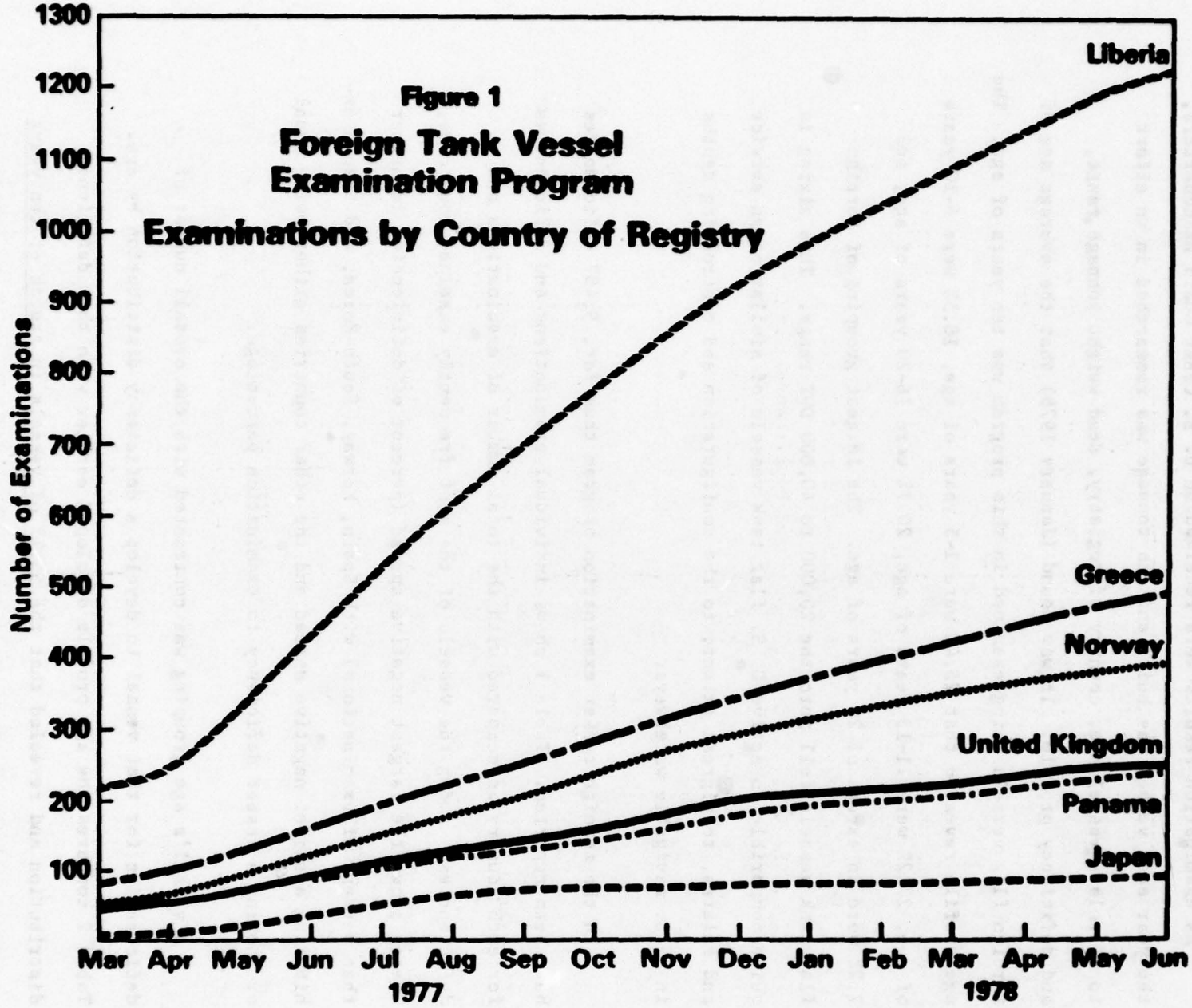
d. Justification for additional resource requests

e. Justification of U. S. proposals in the ongoing international effort at IMCO to improve tanker safety and reduce oil pollution

f. Providing feedback to Coast Guard field offices

In the eighteen months (January 1977 through June 1978) that the foreign tanker examination program has been in effect, there have been 3,427 examinations of 1,530 different vessels in United States coastal ports as well as ports in Puerto Rico, Hawaii and Alaska. Out of this total of 3,427 vessel examinations, 1,598 examinations revealed no deficiencies aboard the vessels while the remaining 1,829 examinations resulted in the issuing of deficiency letters to the Masters of these foreign flag tankers.

The number of foreign flag tanker examinations by country of registry, Figure 1, shows that tank vessels from Liberia have been examined almost 2.5 times as frequently as tank vessels from Greece, which in turn is followed closely by tank vessels from Norway, United Kingdom, Panama, Japan, and vessels from thirty-nine other countries.


Figure 1
Foreign Tank Vessel
Examination Program
Examinations by Country of Registry
Number of Examinations
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
Liberia
Greece
Norway
United Kingdom
Panama
Japan
Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
1977
1978

As examination results were received in U. S. Coast Guard Headquarters, the year each vessel was built and its tonnage was researched in an effort to correlate vessel age, country of registry, dead weight tonnage range, and deficiency profile. It was found (January 1978) that the average age of foreign flag vessels being examined in this program was ten years of age. The age profile revealed that 25.4% were 1-5 years of age, 18.5% were 6-10 years of age, 27.2% were 11-15 years of age, 20.7% were 16-20 years of age, and 7.2% were in excess of 20 years of age. The largest grouping of foreign flag tank vessels fell into the 20,000 to 40,000 DWT range. This sizing is quite comparible to active U. S. flag tank vessels of similar ocean service and relates, to a great extent, to the configuration and controlling depths in U. S. navigable waterways.

In the foreign tanker examination program thus far, 9,487 deficiencies have been reported. Table 1 shows individual examinations and deficiencies for each country as compared with the total number of examinations and deficiencies. Among the vessels of the most frequently examined countries, Greece shows the largest negative spread (percent of deficiencies is higher than percent of examinations) with Spain, Norway, South Korea, and France exhibiting a slight negative spread and the other countries either being equal or showing a lesser deficiency to examination percentage.

A vessel's age grouping was contrasted with the overall number of deficiencies for that vessel to develop a deficiency distribution by age. Table 2 compares the age profile developed earlier with this deficiency distribution and revealed that the 55.1% of vessels in excess of ten years of age accounted for 73.6% of the deficiencies discovered in the administration of this program.

Table 1

Country	Vessel Examinations		Deficiencies	
	No. & % of Total		No. & % of Total	
Liberia	1268	*35.4*	3442	*35.1*
Panama	255	*7.1*	613	*6.3*
Greece	526	*14.7*	2165	*22.1*
Norway	406	*11.3*	1147	*11.7*
Great Britain	258	*7.2*	584	*6.0*
Japan	104	*2.9*	249	*2.5*
Singapore	97	*2.7*	96	*1.0*
Netherlands	59	*1.6*	35	*0.4*
Italy	71	*2.0*	197	*2.0*
France	44	*1.2*	113	*1.2*
Finland	43	*1.2*	89	*0.9*
Denmark	41	*1.1*	32	*0.3*
E.Germany	57	*1.6*	162	*1.7*
S. Korea	38	*1.1*	133	*1.4*
USSR	40	*1.1*	113	*1.2*
Spain	28	*0.8*	127	*1.3*
Mexico	36	*1.1*	113	*1.2*

Table 2

Comparisons by Vessel Age

Age Group in Years of Age	% of Vessels Examined		% of Deficiencies Found	
1-5	25.4		9.1	
6-10	18.5		16.1	
11-15	27.2		31.9	
16-20	20.7	55.1	31.3	73.6
Above 20	7.2		10.4	
Age Unknown	1.0		1.2	

Age Group	Deficiency Type	Percent of Total Def. of That Type
1-10 Years	Ventilation System, Cargo Piping System, Pump Room, Electrical System, Fire Protection Systems	20.6
> 10 Years		78.4
Age Unknown		1.0
1-10 Years	Cargo Handling Gear	30.4
> 10 Years		68.7
Age Unknown		0.9
1-10 Years	Navigation Safety Regulations	43.5
> 10 Years		55.0
Age Unknown		1.5

A tabulation of the deficiency types shows that cargo ventilation system deficiencies were discovered at a rate twice that of the next nearest deficiency type. Similar to the age grouping in the overall distribution of deficiencies, the individual deficiency types exhibit a similar percentage distribution again using vessel's age as a basis. For example, twenty-one percent of the deficiencies discovered in the ventilation system, cargo piping system, pump room, electrical system, and fire protection systems were found aboard vessels of less than ten years of age with the remaining seventy-eight percent (1 percent had unknown ages) found on vessels older than ten years of age. Of the major deficiency categories, only cargo handling gear deficiencies and navigation safety regulations deficiencies did not exhibit as high a percentage favoring older tank vessels. The distribution for these categories was between thirty to forty-three percent for vessels one to ten years old with the remaining fifty-five to sixty-nine percent (1 percent had unknown ages) attributable to tankers over ten years of age. This is logical considering the vital role that these systems play in the daily operation of a tank vessel. It is the attention given to these areas, vice the others, that accounts for the closer percentage distribution between age groupings. An evaluation and enumeration of the deficiency types is as follows:

Cargo and Bunker Venting System - (3,160 deficiencies) - this singular area accounts for the largest number of deficiencies. The most common of these are (1) defective or missing flame screens, (2) defective or missing pressure/vacuum valves, (3) wasted and holed vent piping, and (4) wasted and holed vent masts and vent headers. The above four items have been reported with almost equal frequency.

Cargo Piping Systems - (1,494 deficiencies) - this includes both bunker fuel as well as cargo fuel piping systems with the main deficiency throughout the vessel being wasted, holed and leaking piping, flange, and spool piece connections.

Cargo Handling Equipment - (977 deficiencies) - there are five discrepancies reported with equal frequency and a number of others of lesser frequency. The former include (1) inoperative cargo pumps or cargo pumps leaking excessively, (2) wasted and leaking steam piping to cargo pumps, (3) leaking, wasted or inoperative cargo valves, (4) inoperative stripping pumps and (5) cement boxes in way of wasted sea suction connections to ballast piping, while the latter group includes (1) inoperative cargo pump remote shutdowns, (2) inoperative gauges and cargo monitoring equipment and (3) leaking or inoperative cargo heating coils.

Fire Protection Systems - (699 deficiencies) - there has been a variety of discrepancies in this area with items numbered one through five below being reported most frequently. The deficiencies are (1) wasted, missing and holed steam smothering system piping, (2) inoperative valves in steam smothering system, (3) inoperative fire dampers in pump room ventilation systems, (4) wasted and holed firemain system piping, (5) inoperative fire pumps and firemain valves, (6) missing firehose, (7) portable fire extinguishers missing or requiring service, (8) semi-portable CO2 systems requiring service, and (9) inoperative sprinkler systems or foam monitors.

Pump Room - (805 deficiencies) - the most frequently found pump room deficiencies consist of (1) the presence of excessive product in the bilges, (2) wasted and missing ventilation supply and exhaust ducting,

and (3) missing or holed ventilation supply and exhaust duct flame screens. Other deficiencies found within the pump room areas include (1) inoperative bilge pumps and disconnected reach rods, (2) flammable materials and loose tools adrift, (3) defective pump room weather deck watertight doors, and (4) missing or broken ladder rungs.

Electrical Systems - (609 deficiencies) - the electrical examination is concentrated mainly in the pump room areas and on the weather deck with the primary deficiencies being (1) defective explosion proof lights and junction boxes and (2) jury rigged wiring and installations. Other electrical deficiencies include (1) dead ended wiring, and (2) inadequate or non-approved lighting, such as, drop cords and fixtures with exposed light bulbs.

Structural Deficiency - (248 deficiencies) - the most frequently reported strutural deficiencies are (1) cracks in the pump room bulkheads between the cargo tanks and the pump room, causing cargo leakage into the pump room, and (2) cracks and holes between the pump room and the engine room. Other structural deficiencies include (1) defective main deck watertight doors leading into deck houses, (2) cement boxes on hull and sea suction valves, and (3) cracks in main deck and superstructure bulkheads.

Personnel Protective Equipment - (189 deficiencies) - the three common deficiencies are (1) missing fireman's outfits, (2) missing or defective explosive meters, and (3) missing fresh air breathing apparatus.

Vital Machinery - (23 deficiencies) - the noteworthy deficiencies include (1) defective emergency generator, (2) defective steering gear system, and (3) inoperative auxiliary generator.

Life Saving Equipment - (23 deficiencies) - the deficiencies have centered about (1) missing life rings, (2) missing or inoperative life ring lights, and (3) defective lifeboats.

Ship's Ventilation System - (11 deficiencies) - the primary discrepancy has been wasted and holed ventilation ducting thereby permitting the egress of explosive vapors into the living spaces of the vessel.

Navigation Safety Regulations - (1,000 deficiencies) - the major deficiency reported has been the lack of posted vessel maneuvering information and to a much lesser extent the lack of U. S. navigation publications and updated charts of the areas to be transited.

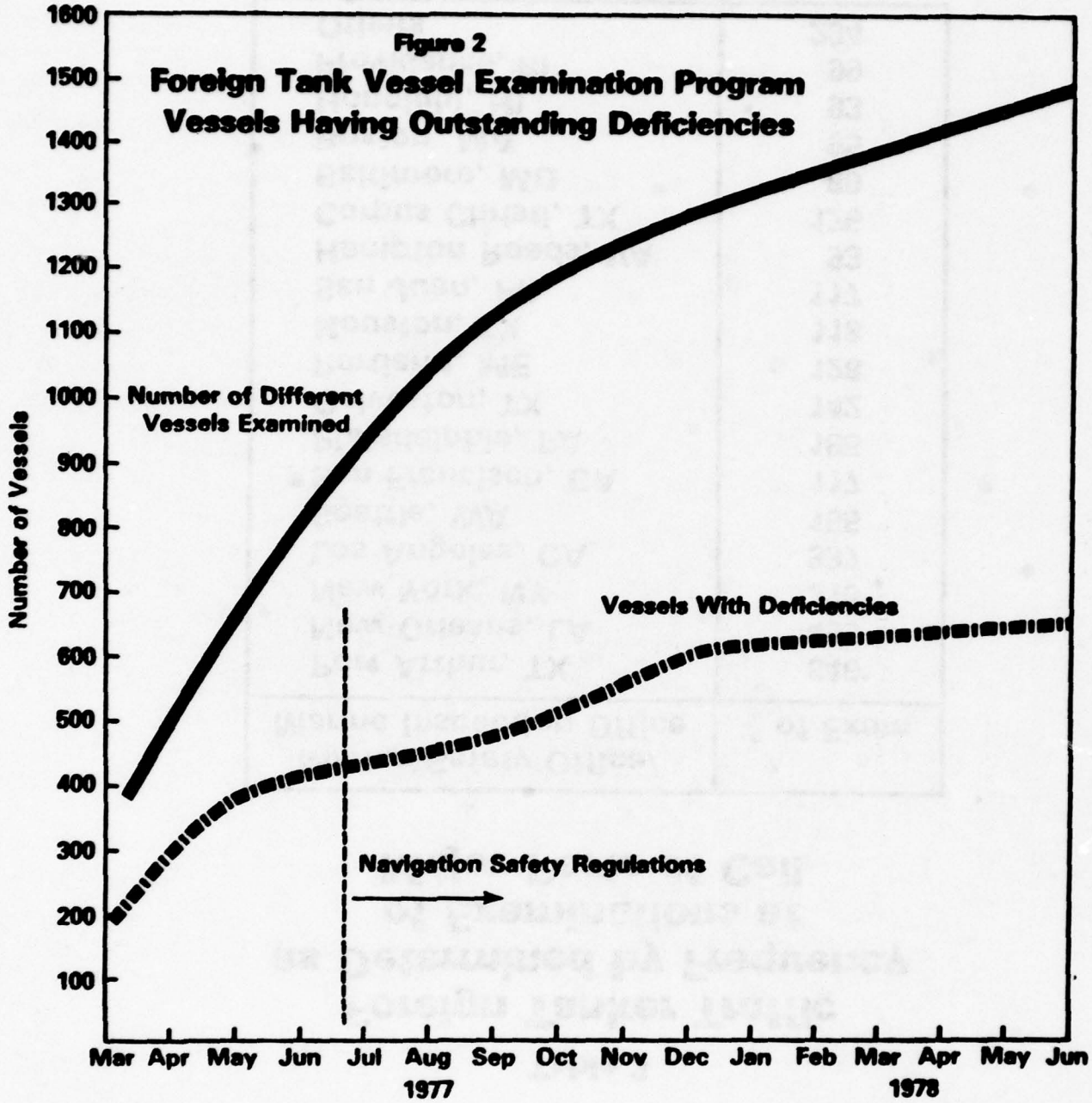
The impact of this newly created program caused considerable strain on existing U. S. Coast Guard personnel resources. Accordingly, the Coast Guard requested and received during fiscal years 1978 and 1979, 163 additional officer and enlisted billets, most of which have been filled for assignment to field offices for the foreign tanker examination program. The priorities for assignment of these personnel resources were primarily determined by the level of activity of a particular Marine Safety Office or Marine Inspection Office. Table 3 indicates the frequencies of foreign tank vessel examinations at various ports throughout the United States. The list is not all inclusive and only shows the more active ports.

The major question to be answered is "Has this new program during its brief infancy increased the overall safety level aboard foreign flag tank vessels?" One method of evaluating the progress of this program is depicted in Figure 2 by way of a comparison, over time, of the number of foreign flag tank vessels having outstanding deficiencies to the total number of different vessels involved in the program. The resurgence, around 1 July 1977, in the number of vessels with deficiencies was due to the influence of the newly effective navigation safety regulations. The recent decrease in

Table 3

Foreign Tanker Traffic as Determined by Frequency of Examinations at Major Ports of Call

Marine Safety Office/ Marine Inspection Office	# of Exam
Port Arthur, TX	646
New Orleans, LA	499
New York, NY	315
Los Angeles, CA	337
Seattle, WA	155
San Francisco, CA	117
Philadelphia, PA	185
Galveston, TX	142
Portland, ME	128
Houston, TX	118
San Juan, PR	117
Hampton Roads, VA	93
Corpus Christi, TX	125
Baltimore, MD	80
Boston, MA	95
Honolulu, HI	93
Providence, RI	99
Others	234


Figure 2
Foreign Tank Vessel Examination Program
Vessels Having Outstanding Deficiencies
Number of Vessels
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
Number of Different Vessels Examined
Vessels With Deficiencies
Navigation Safety Regulations
Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun
1977
1978

the slope of the curve representing number of different vessels examined is because the great majority of foreign flag tank vessels trading at U. S. ports have been examined at least once each year. The large numbers of vessels continuing to exhibit deficiencies are older vessels whose material and maintenance state would tend to preclude the complete absence of deficiencies upon close examinations of this kind. Therefore, it is anticipated that the slope of the curve representing vessels with deficiencies may level off for periods of time, but a significent decline in this slope is not forseen in the immediate future. The deficiency letters themselves show that some vessels are remaining on the deficiency listing because it was considered safe in these instances to defer permanent repairs until the next scheduled drydocking period. This, as well as the nature of some of the navigation safety regulation deficiencies, has tended to inflate the figures representing number of vessels with outstanding deficiencies.

Lloyd's Register of Shipping Quarterly Returns for the January-December 1977 period listed as being broken-up (scrapped) twenty-five vessels that had exposure to the U. S. Coast Guard through the foreign tank vessel examination program. Examining the records of these tank vessels revealed that for some of these vessels, the results of the Coast Guard examinations may have had an influence on the decision to scrap, in addition to age, and other economic considerations. Further, since the program began, there have been many other vessels who have called once at U. S. ports, been examined by USCG personnel, and have not returned. This reduction in the number of foreign flag tankers having poor historical records is in keeping with the overall goal of the program.

Evidence of an improving level of safety can be shown by a comparison (Table 4) of deficiency data during the three six month periods since the beginning of the program. When comparing the number of deficiencies per examination for the three periods using the six countries noted in earlier sections, the overall picture is a significant reduction in the number of deficiencies per examination for the most recent period. The majority of the countries exhibited an overall decline in the number of deficiencies per examination during this time frame. The lower half of Table 4 contains a comparison of the percentage of examinations free of deficiencies and presents overall results similar to the upper half in that the most recent period had the highest percentage of deficiency free examinations. Regarding the material and physical aspects of the cargo handling and venting systems, Table 4 supports the statement that continuing emphasis through this program has helped affect needed repairs to specific shipboard systems. Also evident in Table 4 is the steady decrease in the number of examinations conducted during each succeeding period. This is in keeping with the philosophy and the instructions promulgated to field units that each foreign flag tank vessel shall be examined at least once a year, and more often if necessary, to insure the vessel meets all safety and environmental requirements. During the initial six month period, the concentration, as expressed by the frequency of examinations, was quite intense. As repeated examinations were performed in several ports, the condition of the vessel was ascertained, recorded, and made available for interrogation upon subsequent visits to U. S. ports. Having access to the immediate examination history of the vessel has introduced an element of selectivity with respect to the decision to perform an examination during a specific

Table 4

A Comparison of Deficiencies/Examination and Percentage of Examinations Without Deficiencies for Several Countries for Three Six Month Periods

Registry	To June 30, 1977			1 July 1977 to 31 Dec 1977			1 Jan 1978 to 30 June 1978		
	No. of Def.	No. of Exam	Def/Exam	No. of Def.	No. of Exam	Def/ Exam	No. of Def.	No. of Exam	Def/Exam
Liberia	2190	581	3.77	891	436	2.04	337	227	1.49
Panama	298	111	2.69	159	91	1.75	135	50	2.70
Greece	928	210	4.42	775	179	4.33	395	123	3.21
Norway	485	163	2.98	463	149	3.11	177	87	2.03
U.K.	318	120	2.65	152	86	1.77	87	46	1.89
Japan	126	46	2.74	42	24	1.75	80	30	2.67
Total	5156	1584	3.26	2982	1192	2.50	1479	734	2.02

Examinations Without Deficiencies

Registry	No. of Exam W/O Def.	No. of Exam	% of Exam W/O Def.	No. of Exam W/O Def.	No. of Exam	% of Exam W/O Def.	% of Exam W/O Def.	No. of Exam	No. of Exam W/O Def.
Liberia	264	581	45.4%	210	436	48.2%	127	227	55.9%
Panama	51	111	45.9%	48	91	52.7%	20	50	40.0%
Greece	71	210	33.8%	61	179	34.1%	46	123	37.4%
Norway	77	163	47.2%	61	149	40.9%	39	87	44.8%
U.K.	66	120	55.0%	38	86	44.2%	24	46	52.2%
Japan	24	46	52.2%	12	24	50.0%	9	30	30.0%
Total	749	1584	47.3%	537	1192	45.1%	356	734	48.5%

port call. Summarizing, the data developed thus far shows that there has been a general improvement in the overall level of safety to that segment of the foreign flag fleet that have been involved in this program.

Since the commencement of this program, the Coast Guard has, under the authority of the Ports and Waterways Safety Act, denied entry to six tank vessels and has detained fourteen additional tank vessels under the control provisions of SOLAS 60, Chapter 1, Regulation 19 which states that such steps shall be taken to insure that the ship shall not sail until it can proceed to sea without danger to the passengers or the crew.

In closing, analysis of available data concerning the results of the examinations shows that the program has achieved a certain measure of success with respect to raising the overall level of safety of tankers calling at our ports. What remains now is the true test, that is, a period of time free of tanker casualties caused by those shipboard systems associated with the stowage and movement of the liquid cargo itself.

APPENDIX 6

BACKGROUND AND SUMMARY

REGARDING THE

INTERNATIONAL CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION

HELD IN

LONDON, ENGLAND

6-17 FEBRUARY 1978

TABLE OF CONTENTS

	PAGE
PURPOSE	1
BACKGROUND	2
ACTION TO CARRY OUT THE PRESIDENTIAL INITIATIVES	5
DOMESTIC	5
INTERNATIONAL	6
PREPARATION FOR THE INTERNATIONAL CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION	8
PACKAGE PROPOSALS	11
EXISTING INTERNATIONAL AGREEMENTS	16
RELATIONSHIP OF THIS ACTION TO PREVIOUS U. S. ACTIONS	20
INTERNATIONAL CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION	23
ARTICLES	24
DOUBLE BOTTOMS - SEGREGATED BALLAST TANKS/PROTECTIVE LOCATION	27
CLEAN BALLAST TANKS	31
CRUDE OIL WASHING	32
SPECIFIC TRADES AND SPECIAL BALLAST	35
INERT GAS SYSTEM	38
INSPECTION AND CERTIFICATION	39
IMPROVED EMERGENCY STEERING STANDARDS	41
2ND RADAR AND COLLISION AVOIDANCE AIDS	47
IMPLEMENTATION	49
APPENDIX A	51
APPENDIX B	53
APPENDIX C	55
APPENDIX D	57

Tables

		Page
Table 1	Revised schedule of IMCO meetings held during 1977 to prepare for February 1978 Tanker Safety and Pollution Prevention Conference. . . .	10
Table 2	United States Proposal.	13
Table 3	Package 1.	14
Table 4	Package 2.	15

PURPOSE

The purpose of this report is to summarize the work done by the International Conference on Tanker Safety and Pollution Prevention (TSPP) held in London, England from 6-17 February 1978. Further, both background information regarding events leading to the Conference and explanations of work done by individual working groups during the Conference are included. Following publication of this report the Coast Guard intends to publish in the Federal Register, a Notice setting forth the scope of future regulatory action and a timetable for implementation. Coast Guard policy regarding implementation of these new standards is set forth in the final section of this report.

The conference was sponsored by the Intergovernmental Maritime Consultative Organization (IMCO), the specialized agency of the United Nations concerned solely with maritime affairs. The conference considered proposals made by the United States for modifications to the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73), and the International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), along with alternative proposals from other nations developed during preparatory meetings sponsored by IMCO.

BACKGROUND

During the Winter of 1976/1977 several tanker casualties occurred in or near U.S. waters which illustrated the need for a global effort to improve both the levels of safety and degree of pollution protection from oil tankers.

This series of accidents created great public concern within the United States over the risks associated with the marine transportation of oil. Demands were made for the Federal government to take additional steps to improve tanker safety and pollution prevention.

Both the Executive branch of the Federal government and the Congress responded to these demands. President Carter established an Interagency Oil Pollution Task Force to review the problem and make recommendations. As a result, in a message to Congress on March 17, 1977, the President announced a series of Federal government actions which would deal with the problem of marine oil pollution from tankers and of tanker safety.

The Presidential Initiatives, announced on March 17, 1977, included a diverse but interrelated group of measures designed to reduce the risks associated with the maritime

transportation of oil. These measures, both international and domestic in nature and scope, were aimed at achieving the following objectives:

- Reduce oil pollution caused by tanker accidents and by routine operational discharges from all vessels;

- Improve our ability to deal swiftly and effectively with oil spills;

- Provide full and dependable compensation to victims of oil pollution damage;

- Reduce risk of tanker accidents and resulting loss of life and property damage.

The measures recommended by President Carter included:

- Ratification of the International Convention for the Prevention of Pollution from Ships (MARPCL 73)

- Reform of Ship construction and equipment standards to include the following for all oil tankers over 20,000 DWT:

  - Double bottoms on all new tankers;

- Segregated ballast on all tankers;

- Inert gas systems on all tankers;

- Backup radar and collision avoidance equipment on all tankers;

- Improved emergency steering standards for all tankers;

- Where technological improvements and alternatives can be shown to achieve the same degree of protection against pollution or improvement of safety, any implementing rulemaking may allow such use.

• Improvement of the international system for inspection and certification of tankers

• Improvement of crew standards and training, including any necessary changes to licensing and qualification standards for American crews, and upgrading of international requirements

• Development of an expanded tanker boarding program and marine safety information system

• Approval of comprehensive oil pollution liability and compensation legislation

• Improvement of Federal ability to respond to oil pollution emergencies.

ACTIONS TO CARRY OUT THE PRESIDENTIAL INITIATIVES

In carrying out the program announced by the President, the following actions have taken place in the Domestic and International arenas:

Domestic:

• The 1973 Marine Pollution Convention has been submitted to the Senate for advice and consent and implementing legislation has been submitted to both houses of Congress;

• Proposed regulations incorporating the recommended changes to ship construction and equipment standards have been published, (Federal Register dated May 16, 1977);

• The Coast Guard has intensified its efforts to improve qualification and training of U.S. crews through development of new requirements for tankermen, new licensing requirements for pilots, improved requirements for radar observer endorsement, and examination of a possible

requirement for shiphandling simulator training for masters and chief mates on large vessels;

• The Tanker Boarding Program has been expanded so that each foreign tanker calling at U.S. ports is boarded and examined annually for compliance with all safety and pollution standards presently applicable to foreign flag tankers under both domestic regulations and international agreements. A Marine Safety Information System has been developed to maintain records of vessel casualties, pollution incidents, violations of safety and pollution prevention regulations, and names of vessel owners.

• Legislation designed to provide comprehensive oil pollution liability and compensation has been approved by the House and is awaiting action by the Senate;

• A number of studies are in progress to determine how Federal ability to respond to oil pollution emergencies can be improved.

International:

• The United States proposed changes to the present international standards for tanker construction and

equipment and the international system of inspection and certification of tankers. These proposals were considered with various alternatives proposed by other nations at the International Conference on Tanker Safety and Pollution Prevention, held at London, 6-17 February 1978;

- The United States requested and IMCO agreed to reschedule the International Conference on Training and Certification of Seafarers for 14 June - 7 July 1978 from its planned date in the fall of 1978.

- Following the Conference dealing with Training and Certification of Seafarers, IMCO is scheduled to take up the subject of manning.

Thus, through IMCO, worldwide improvements for tanker safety and pollution prevention are being dealt with comprehensively, i.e., by improvements in ship design and equipment standards, establishment of better training and certification requirements for seafarers, and increasing the manning standards for ships. The TSPP Conference therefore, represents only a part of the total effort by the United States to improve tanker safety and pollution prevention on an international basis.

PREPARATION FOR THE INTERNATIONAL CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION

The United States proposed international action to improve tanker safety and pollution prevention in accordance with the Presidential Initiatives at the thirty-sixth session of the Maritime Safety Committee (MSC) of IMCO in April 1977. In response to the U.S. request, the MSC agreed on the following rearrangement of the work program, subject to approval by the IMCO Council:

(a) To convene an International Conference on Tanker Safety and Pollution Prevention from 6 to 17 February 1978;

(b) To bring forward the date of the Conference on Training and Certification of Seafarers to 14 June - 7 July 1978;

(c) To set up an Intersessional Working Group on Tanker Safety and Pollution Prevention (TSPP), open to all IMCO members and organizations in consultative status, to consider in detail the United States proposals as well as any other alternative or additional proposals; and

(d) To hold a joint Maritime Safety Committee/Marine Environmental Protection Committee (MSC/MEPC) meeting from 10 to 21 October 1977 to formulate proposals and documentation for the Conference.

This amended work schedule was approved by the IMCO Council in May 1977 and, as a result, the meetings shown in Table 1 were conducted in preparation for the February Conference.

Table 1

REVISED SCHEDULE OF IMCO MEETINGS HELD DURING 1977 TO PREPARE FOR FEBRUARY 1978 TANKER SAFETY AND POLLUTION PREVENTION CONFERENCE

April 1977.	U.S. proposed international action; MSC agreed to rearrange work program and schedule conference for Feb 1978.
May 1977	Secretary Adams presented statement to IMCO Council; approved work program and conference scheduled.
	Intersessional Working Group on tanker safety and pollution prevention (TSPP), 1st session
June 1977	MEPC, 7th session, concurred with action by MSC and Council
	TSPP, 2nd session
July 1977	TSPP, 3rd session
September 1977	Subcommittee on Safety of Navigation, 20th session
October 1977	Joint MSC/MEPC Meeting
December 1977	MEPC, 8th session

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"PACKAGE" PROPOSALS

The joint MSC/MEPC Meeting held in October 1977 recognized that the questions of segregated ballast tanks, alternative and interim measures (e.g., clean ballast tanks, crude oil washing), and inert gas systems were closely related. In developing alternative proposals to be considered at the February Conference, the Joint Meeting agreed that the various proposals for SBT, CBT, COW, and IGS should take the form of "package" proposals addressing the specific alternatives and indicating the extent of application of the requirements to:

- new or existing oil tankers;
- crude oil tankers or product carriers;
- deadweight of ships above which requirements should apply;
- date from which the requirements should become effective.

At the Joint Meeting, numerous specific proposals containing these elements were put forward by delegations. These were reduced to two major package proposals, i.e., Package 1 and Package 2, each containing proposed draft texts for inclusion in Protocols modifying MARPOL 73 and SOLAS 74. These two "package" proposals were considered, along with the original United States proposals at the February

Conference. These "package" proposals are shown in Tables 2, 3, and 4. The U.S. proposal for double bottoms remained as a separate item.

Work was also done at the Joint Meeting on proposals by the U.S. and others with respect to dual radars, collision avoidance aids, emergency steering standards, and inspection and certification.

Table 2

United States Proposal

	CRUDE CARRIERS		PRODUCT CARRIERS (Black and White Oils)	
	NEW SHIPS	EXISTING SHIPS	NEW SHIPS	EXISTING SHIPS
CLEAN BALLAST TANKS				
(a) Non-free-flow ships				
(i) Tonnage limit (dwt)		20,000		20,000
(ii) Implementation		6/78 to 6/82		6/78 to 6/82
(b) Free-flow ships				
(i) Tonnage limit (dwt)		20,000		20,000
(ii) Implementation		6/78 to 6/82		6/78 to 6/82
SEGREGATED BALLAST TANKS				
(i) Tonnage limit (dwt)	20,000	20,000	20,000	20,000
(ii) Implementation	6/82	6/82	6/82	6/82
INERT GAS				
(Applicable to oils with a flash point below 60° C)				
(i) Tonnage limit (dwt)	20,000	20,000	20,000	20,000
(ii) Implementation	6/82	6/82	6/82	6/82
CRUDE OIL WASHING				
(i) Tonnage limit (dwt)				
(ii) Implementation				

Table 3

Package 1

	CRUDE CARRIERS		PRODUCT CARRIERS (Black and White Oils)	
	NEW SHIPS	EXISTING SHIPS	NEW SHIPS	EXISTING SHIPS
CLEAN BALLAST TANKS				
(a) Non-free-flow ships				
(i) Tonnage limit (dwt)		20,000		50,000
(ii) Implementation		H to H + 2 years		H to H + 2 years
(b) Free-flow ships				
(i) Tonnage limit (dwt)		DW reduction only 20,000		
(ii) Implementation		H to H + 2 years		
SEGREGATED BALLAST TANKS				
(i) Tonnage limit (dwt)	20,000	20,000	20,000	50,000
(ii) Implementation	H	H + 2 years	H	H + 5 years
INERT GAS				
(Applicable to oils with a flash point below 60° C)				
(i) Tonnage limit (dwt)	20,000	20,000	50,000	50,000
(ii) Implementation	H	H + 5 years	H	H + 5 years
CRUDE OIL WASHING				
(i) Tonnage limit (dwt)	COW must comply with IMCO procedures if used	COW must comply with IMCO procedures if used	COW must comply with IMCO procedures if used	COW must comply with IMCO procedures if used
(ii) Implementation				

H = date of entry into force

Table 4

Package 2

	CRUDE CARRIERS		PRODUCT CARRIERS (Black and White Oils)	
	NEW SHIPS	EXISTING SHIPS	NEW SHIPS	EXISTING SHIPS
CLEAN BALLAST TANKS				
(a) Non-free-flow ships				
(i) Tonnage limit (dwt)				
(ii) Implementation				
(b) Free-flow ships				
(i) Tonnage limit (dwt)				
(ii) Implementation				
SEGREGATED BALLAST TANKS				
(i) Tonnage limit (dwt)	70,000	70,000 (or COW alt)	70,000	
(ii) Implementation	MARPOL 73	H + 3 years	MARPOL 73	
INERT GAS				
(Applicable to oils with a flash point below 60° C)				
(i) Tonnage limit (dwt)	50,000 or 20,000W.M.	50,000 or 20,000W.M.	100,000 or 50,000W.M.	70,000W.M.
(ii) Implementation	H + 3 years	H + 3 years	H	H + 3 years
CRUDE OIL WASHING				
(i) Tonnage limit (dwt)		70,000		
(ii) Implementation		H + 3 years		

H = date of entry into force
WM = fitted with fixed washing machines of capacity greater than 60 m^3/hr

EXISTING INTERNATIONAL AGREEMENTS

In 1973, IMCO convened an International Conference on Marine Pollution which developed the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73), which would supersede the 1954 Oil Pollution Convention (as amended). This Convention broadened earlier regulations for dealing with oil pollution from ships and introduced new requirements relating to other forms of pollution such as noxious liquid substances, harmful substances in package forms, sewage, and garbage.

With respect to the discharge of oil, Annex I of the Convention maintains substantially similar criteria to those specified in the 1969 Amendments to the 1954 Oil Pollution Convention (which came into force internationally on 20 January 1978) but also contains several new requirements which will have profound effects particularly on the operations of oil tankers. These are:

(a) The definition of "oil" has been broadened to mean petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products (other than petrochemicals);

(b) For new tankers, the total quantity of oil which may be discharged into the sea due to operations must not exceed 1/30,000 of the total quantity of the particular cargo of which the residue formed a part;

(c) Oil tankers must be fitted with oil discharge monitoring and control equipment, including a recording device to provide a continuous record of any discharge;

(d) Any ship of 400 gross tonnage and above must be fitted with an oily-water separating equipment or a filtering system;

(e) Certain regions, including the Mediterranean Sea, the Black Sea, the Baltic Sea, the Red Sea, and the "Gulfs area" (Persian or Arabian Gulf) have been designated as "special areas" in which any discharge of oil or oily mixture into the sea is prohibited except in cases of "force majeure";

(f) Parties to the Convention are obliged to ensure the provision of adequate reception facilities for residues and oily mixtures at oil loading terminals, repair ports, and in other ports in which ships have such residues to discharge; in certain special areas these facilities must be provided by 1 January 1977 and must be adequate for the reception and

treatment of all the dirty ballast and tank washings from tankers.

In addition, the 1973 Convention introduces certain requirements for the construction and equipment of ships with respect to the prevention of operational discharges of oil and the mitigation of uncontrolled release of oil should accidents to tankers occur. The following is a summary of these requirements (without the modifications and additions from the 1978 Protocol):

(a) oil tankers must be provided with suitable slop tank arrangements with the capacity necessary to retain the slops generated by tank washings, oil residues and dirty ballast residues;

(b) new oil tankers of 70,000 tons deadweight and above must be provided with segregated ballast tanks of sufficient capacity to enable them to operate safely on ballast voyages without recourse to the use of oil tanks for water ballast except in very severe weather conditions;

(c) requirements for tank arrangement and limitation of tank size from the 1971 amendments to the 1954 Convention were adopted with a later effective date;

(d) new subdivision and damage stability requirements were introduced to ensure that tankers can survive assumed side or bottom damage to a degree specified on the basis of their length.

The Convention will enter into force twelve months after ratification or acceptance by at least 15 countries, representing at least 50 percent of the gross tonnage of the world's merchant shipping. To date, the Convention has been ratified by three countries. MARPOL 73 was submitted to the Senate for advice and consent on 22 March 1977.

In 1974, IMCO convened an International Conference on Safety of Life at Sea which elaborated a new International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), intended to supersede the 1960 Safety Convention and also introduced simplified procedures for amending technical provisions. SOLAS 74 significantly upgrades fire protection and fire prevention for all tankers and contains requirements for inert gas systems for new tankers over 100,000 DWT and new combination carriers over 50,000 DWT.

The inspection and certification, steering, and radar requirements are essentially the same as those contained in SOLAS 60. IMCO Resolution A,325(IX), adopted by the

Assembly on 12 November 1975, contains standards to improve the operation and reliability of steering gear. The Assembly in its Resolution recommended that the Maritime Safety Committee seek to achieve these standards as amendments to SOLAS '74 after its entry into force.

SOLAS 74 will enter into force twelve months after ratification or acceptance by at least 25 countries, the combined merchant fleets of which constitute not less than fifty percent of the gross tonnage of the world's merchant shipping. Eleven countries have ratified SOLAS 74. SOLAS 74 was submitted to the Senate for advice and consent in August 1976.

RELATIONSHIP OF THE U.S. INITIATIVES TO PREVIOUS U.S. ACTIONS

The U.S. proposals to IMCO were consistent with national regulations published as proposed rules in the Federal Register on 16 May 1977. The primary thrust of these actions and previous U.S. actions since MARPOL '73 is the reduction of both accidental and operational pollution of the seas by oil from tankers. The previous U.S. actions were:

• October 1973 - Completion of MARPOL '73 in London, England. The U.S. has not ratified MARPOL '73 yet, but the convention was submitted to the Senate on 22 March 1977 for advice and consent. (By regulatory action, however, the U.S. has, in effect, unilaterally implemented Annex I of the Convention dealing with oil pollution.) Three countries have ratified MARPOL '73 but it is not yet in force.

• November 1974 - Completion of SOLAS '74 in London, England. The U.S. has not ratified SOLAS '74, but the convention was submitted to the Senate on 31 August 1976 for advice and consent. Eleven countries have ratified SOLAS '74 but it is not yet in force.

• 14 October 1975 - Final U.S. regulations were published making segregated ballast tank (SBT) requirements applicable to new U.S. tank vessels of 70,000 DWT or over in the domestic trade and making operational discharge standards applicable to new and existing U.S. tank vessels of 70,000 DWT or over in the domestic trade.

• 8 January 1976 - Final regulations were published for the defensive placement of segregated ballast tanks on new U.S. tank vessels over 70,000 DWT in domestic trade.

• 13 December 1976 - Final U.S. regulations were published extending the application of SBT to new U.S. tank vessels of 70,000 DWT and greater in foreign trade and new foreign flag tank vessels of 70,000 DWT or greater on the navigable waters of the U.S.; and operational discharge standards to all U.S. vessels of 70,000 DWT or greater in foreign trades and all foreign tank vessels of 70,000 DWT or greater on the navigable waters of the United States. These regulations also extend the requirement for defensive placement of segregated ballast tanks to new U.S. tank vessels in foreign trade and to new foreign flag tank vessels on the navigable waters of the United States.

• 16 May 1977 - Proposed U.S. regulations, applicable to tank vessels of over 20,000 DWT, were published in accordance with the directive of the Presidential Initiatives which would require SBT on existing tankers and double bottoms on new tankers. Improved emergency steering standards, a second radar system with a computer aided collision avoidance system and inert gas systems were also proposed.

INTERNATIONAL CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION

The International Conference on Tanker Safety and Pollution Prevention was held in London, England from 6-17 February 1978 to consider the U.S. initiatives together with alternative measures formulated at the previously held MSC/MEPC Joint Meeting. The Conference was attended by more than 450 delegates from 62 nations, 16 international organizations, and observers from 3 nations. The U.S. delegation was headed by the Deputy Secretary of Transportation and included representatives from the U.S. Congress, State Dept., Coast Guard, EPA, CEQ, NOAA, MARAD, industry, labor, and non-governmental environmental organizations. Results of the Conference are summarized in Appendix A. Commensurate with the primary negotiations, the below listed working groups were created by the committees to consider technical proposals and make recommendations:

Committee I	Committee II	Committee III
• Articles	• Radar & CAA	• SBT/PL
	• Improved Steering Standards for Tankers	• CBT Guidlines
		• COW
	• Inspection & Cert.	• Specific Trades & Special Ballast

Measures considered by the working groups including the U.S. proposals and those adopted by the conference are discussed in the following paragraphs.

ARTICLES

Committee I considered the draft SOLAS and MARPOL Protocol Articles. Thirty-two delegations participated in the work of the committee which was completed in four days.

The principal issue with regard to the Protocols was whether each should be an instrument separate from and independent of its parent Convention (Approach A), or should incorporate its parent Convention by reference (Approach B). The U.S. Delegation favored Approach B for both Protocols. However, the Delegation was prepared to accept Approach A for the SOLAS Protocol.

After extensive discussion, Committee I adopted Approach A for the SOLAS Protocol. A separate Protocol was preferred in order to facilitate early entry into force of the Convention, which has already been ratified by eleven states and is presently being considered by others.

Early entry into force of the SOLAS Protocol is facilitated by inclusion of a formula for entry into force which is less stringent than the parent Convention formula (but the Protocol cannot enter into force before the Convention). The U.S. supported a proposal requiring that fifteen states, the combined merchant fleets of which constitute 50 percent of the gross tonnage of the world's merchant shipping, become Parties to bring the Protocol into force. This proposal was adopted by the Committee.

With regard to the MARPOL Protocol, the Committee adopted Approach B instead of Approach A for two principal reasons. First, only three states have ratified MARPOL, as opposed to eleven ratifications of the SOLAS Convention. Consequently, adoption of an integrated MARPOL approach will not significantly delay entry into force of the Convention. Second, many states expressed reluctance to ratify the MARPOL Convention due to their present technological inability to comply with the regulations set forth in Annex II. Annex II requires Parties to the Convention to ensure the provision of reception facilities for residues and mixtures containing noxious liquid substances. In order to expedite entry into force of Annex I to the Convention (a goal considered very desirable by most states), it was agreed to delay entry into force of Annex II for three years

(or such longer period as may be determined by a two-third's majority of Parties to the Protocol present and voting in the Marine Environment Protection Committee). Since Annex II is an integral and mandatory part of the Convention, such delay can be accomplished satisfactorily only if the Protocol and Convention are read together as one single instrument and come into force on the same date.

Although the United States preferred the implementation of Annex II without delay, the delegation agreed to a delay in order to expedite early entry into force of Annex I.

Another U.S. position with regard to the SOLAS Protocol supported inclusion of a provision requiring no more favorable treatment for ships of non-Parties than provided for ships of Parties to the Protocol. It was felt that fairness dictated that ships of non-parties should not enjoy an advantage (non-compliance with the new standards) over ships of Parties to the Convention. This provision was adopted by the Committee without any comment.

The instruments adopted by Committee I and recommended to plenary were then adopted by plenary without significant change.

DOUBLE BOTTOMS - SEGREGATED BALLAST TANKS/PROTECTIVE LOCATION (SBT/PL)

The United States proposal for double bottoms would require a double bottom beneath the cargo carrying portions of a seagoing oil tank vessel's hull if the vessel were 20,000 tons DWT or more and constructed under a contract awarded after December 31, 1979. The double bottom would be required to have a minimum height, i.e., separation between inner bottom plating and bottom shell plating, of at least the molded breadth divided by 15 (B/15) or two meters, whichever is less. The double bottom tanks could be used for segregated ballast, but could not be used for oil, either cargo or fuel.

The U.S. proposal for segregated ballast would require that all seagoing oil tank vessels (new and existing) of 20,000 DWT or more have a segregated ballast capability. Vessels would have to be equipped with segregated ballast tanks which are completely separated from the cargo oil and oil fuel systems and which are permanently allocated to the carriage of water ballast. Enough segregated ballast capacity must be provided to enable the vessel to meet specific minimum draft and maximum trim requirements in any ballast condition at any stage of a ballast voyage,

including the condition of lightweight plus segregated ballast only. The propeller must also be fully immersed.

The intent of this requirement is to provide vessels with enough segregated ballast capacity that the ship may be operated safely on ballast voyages without putting water ballast in oil tanks except in unusually severe weather. The master of the vessel would be permitted to place additional ballast water in oil tanks in cases where he feels it must be done for the safety of the ship.

Prior to the Conference, the United States indicated in TSPP/CONF/7/26 that it believed that bottom-damaging incidents constituted a serious pollution threat, particularly to inshore waters, and that a requirement for double bottoms would be an effective measure to reduce such pollution. Realizing, however, that a vast majority of other delegations had strong reservations about any mandatory requirement for double bottoms, the United States supported development of the concept of protective location of segregated ballast tanks as an alternative to double bottoms. The United States also expressed the view that any alternative to the double bottom proposal should provide comparable benefits in reduction of accidental oil outflow and improvement to safety and that such improvement might

well require significant changes in the way ships are designed, adding new constraints and requiring more work by the designer in order to develop satisfactory designs.

The working group reviewed previous work on the concept of relating side and bottom shell protected area to the hypothetical oil outflow limits already in MARPOL 73 (the so-called "Acapulco" and "Japanese" formulae) and a revised proposal by the Japanese delegation. After considerable discussion, the working group reconfirmed the conclusion reached at the Joint Meeting that, because of many difficulties, a formula of this type could not be recommended for the time being.

The group agreed, however, that such an approach did warrant further study and a draft Resolution was developed requesting IMCO undertake development of a more rational probabilistic approach to criteria for the protective disposition of segregated ballast tanks.

The working group then agreed that constraint which required a certain portion of the side and bottom shell area within the cargo tank length to be protected was the best approach for the present until necessary further work on the probabilistic approach referred to in the resolution was

completed. The U.S. indicated prior to the Conference in TSPP/CONF/7/16 that it believed that the use of a formula of this type to constrain the location of SBT could be considered, provided satisfactory answers could be developed to the questions of what portions of the total shell area should be protected and what minimum separation distance between the shell and tank to be protected should be specified for vessel side and bottom. The majority of the Group considered 30 percent acceptable but the U.S. felt 45 percent should be required. The Working Group reported to Committee III that they were unable to reach agreement on a formula acceptable to the U.S. (TSPP/CONF/C.3/WP7). Committee III then sent the working group back to continue their discussions in an attempt to reach a compromise acceptable to the United States. The working group discussed various possible approaches to breaking the deadlock. As a result of these discussions, and associated study of a range of tanker sizes, the group agreed on a proposal to specify an area ratio coefficient of 0.45 for ships of 20,000 DWT, 0.3 for ships of 200,000 DWT and above, with values of area ratio coefficient for intermediate ship sizes determined by linear interpolation with some flexibility based on hypothetical oil outflow.

A discussion of the influence of protective location of SBT on structural design is contained in TSPP/CONF/WP 10.

The new constraints on protective location of segregated ballast spaces contained in Regulation 13E, coupled with the existing requirements for hypothetical oil outflow and limitations on size and arrangement of cargo tanks, will permit the use of double bottom, double side, or alternate wing tank designs.

The application of SBT for existing vessels was dealt with as a part of the composite package in the Committee III negotiations. Thus the working group did not discuss this subject. The application for SBT aboard existing vessels is contained in appendix A to this report.

Results of the group's work are reported in TSPP/CONF/C.3/WP.7, TSPP/CONF/C.3.20, and TSPP/CONF/C.3/WP.10/Add. 1.

The specific requirements for protective location of segregated ballast are found in MARPOL Annex 1, Regulation 13E.

CLEAN BALLAST TANKS CONCEPT (CBT)

The utilization of Clean Ballast Tanks (CBT) was provided for in the composite package. In order that proper control of this feature could be accomplished, a working group consisting of delegations from Norway, Sweden, U.K. and U.S. was formed to consider design controls and operational procedures necessary for clean ballast tanks. The document approved was a Swedish proposal which was suitably amended. The document approved by Committee III requires strict guidelines for operational control as well as providing a requirement that an operational manual be approved by the Administration. Appropriate changes were made to the required certificate to indicate those vessels which operate with Clean Ballast Tanks. A supplement to the Oil Record Book was also developed and accepted.

CRUDE OIL WASHING (COW)

The Conference continued its examination of Crude Oil Washing based on the preparatory work conducted at TSPP II, the joint MSC/MEPC meeting and the December MEPC meeting. A working group was formed to develop rigid specifications for the design, testing and operation of Crude Oil Washing for tankers.

Crude Oil Washing is a method whereby cargo tanks are cleaned utilizing crude oil essentially as a solvent. Due to the solvent action of the crude oil, the amount of oil and sludge which is recovered and pumped ashore is significantly increased. It should be noted that this increased cargo outturn with resultant economic gain was the primary reason COW was developed five years ago. The environmental benefits that accrue are due to the fact that there is significantly less sludge and oil remaining in the cargo tanks after cargo discharge. Thus any ballast water introduced into the cargo tanks i.e., "ballast tanks" will contain a minimum of oil/water mixture. The ship therefore has to process much less oil by load on top and this coupled with the minimization of sludge yields significant environmental benefits.

The Conference accepted/required COW aboard crude oil carriers as follows:

(a) As a requirement for new crude oil carriers of 20,000 tons deadweight and above in addition to the requirement for segregated ballast tanks (SBT) with protective location.

(b) As an alternative to segregated ballast for existing crude oil carriers of 40,000 tons deadweight and above.

Crude oil washing, initially proposed by the U.K. at TSPP II, was accepted as an alternative to segregated ballast in existing crude oil carriers only after the development of satisfactory mandatory Specifications for the Design, Operation and Control of Crude Oil Washing Systems. These Specifications were finalized during the Conference by the working group on Crude Oil Washing, the work of which extended over six days. The working group in performing its task used draft guidelines contained in TSPP/CONF/4/1 and the redraft suggested by the U.K. (TSPP/CONF/7/19) as the basic documents, taking into account other relevant submissions and technical aspects of answers to questions posed by the U.S. delegation. The objective of the working group, however, was to revise and improve the technical content of the draft guidelines. The question of acceptability of crude oil washing as an alternative to segregated ballast tanks was left for Committee III to decide.

The specifications as approved by the working group contain requirements that adequately cover all areas of concern previously expressed by the U.S. and represent a significant expansion and tightening up of the draft guidelines developed at MEPC VIII.

SPECIFIC TRADE AND SPECIAL BALLAST

The working group on Specific Trade and Special Ballast was comprised of delegates from Argentina, Australia, India, Indonesia, Canada, Mexico, Netherlands, Nigeria, Sweden, USSR, U.S. and Venezuela, with observers from ICS and OCIMF. The working group met for four days.

At an early meeting of Committee III, the Netherlands delegation tabled a proposal to exempt ships equipped with permanent fixed ballast from the requirements for SBT, CBT, and/or COW. There was no support for this proposal. The Netherlands delegation subsequently reintroduced a new text concerning Special Ballast to the Committee (TSPP/CONF/C.3/WP.4). This new proposal was considered by Committee III and received considerable support. The Committee requested that the working group on Specific Trades, using the Netherlands proposal as the basic document, prepare a draft text of a regulation on this subject.

The working group agreed on a draft regulation for existing oil tankers having special ballast arrangements, as set out in Annex I to TSPP/CONF/C.3/WP.12. The proposed regulation essentially exempts existing oil tankers from the

requirements for segregated ballast tanks (or its alternatives), where such tankers are fitted with special ballast arrangements (i.e., permanent fixed ballast) or operate in such a manner (oil retained in cargo tanks) so that they comply with the draft and trim requirements of MARPOL without having to take on ballast water. All tanker operational procedures and vessel arrangements will be required to be approved by the Flag State and an agreement is required between the Flag State and the Port State when the draft and trim requirements are achieved through operational procedures.

Committee III approved the Draft Regulation as proposed by the working group without any opposition. The final draft text, as set out in Regulation 13D of the 1973 MARPOL PROTOCOL (TSPP/CONF/D10 was approved at the Plenary Session of the Conference on February 15).

The concept of specific trade was initially proposed by Australia at the joint meeting of the Maritime Safety Committee and Marine Environment Protection Committee. Australia wanted to permit the continued operation of their national vessels between their ports so long as existing reception facilities are utilized for the disposition of oily water ballast. While it is somewhat unusual for IMCO to speak to national trade requirements, many countries such as Australia currently have legislation which requires their

national standards to be in accord with International Standards. This was an attempt to alleviate this domestic situation. Other countries felt that the specific trade concept could have a significant impact with respect to vessels on a routine voyage from their ports to other ports.

As a result of this, Israel, Venezuela, Mexico, Argentina, and the USSR strongly pushed for expansion of specific trade. This was viewed as a serious threat to the package proposal in that it could lead to an expansion of existing trade routes which would exempt existing vessels from requirements developed by the Protocol. Although it was agreed that the concept of specific trade was acceptable for national trade, there were a variety of proposals for its use. They could be generalized as: (a) mileage limitation (2000 miles), (b) voyages within existing Special Areas, and (c) unlimited international voyages between ports having existing reception facilities.

The final method of resolving this dilemma was to permit two options: voyages for national trade, and voyages within existing Special Areas. Additionally, the organization (IMCO), after careful study and analysis, can consider expansion of specific trades with limits other than those laid down in the protocol. A strong resolution was drafted which detailed the general areas of study the organization should undertake prior to expanding the specific trade. The

Conference approved the text of the resolution as well as the regulatory language necessary to permit implementation of specific trade.

INERT GAS SYSTEMS (IGS)

There was no working group on inert gas systems during the Conference. The subject was considered as part of the Composite Package proposal which was developed. The fitting of IGS on all new tankers above 20,000 DWT is consistent with the original initiatives put forward by the United States that an inert gas system (IGS) be fitted on all tank vessels of 20,000 DWT or more. The Composite Package proposal incorporates varying tonnage criteria based on the type of vessel as well as requiring lower tonnage vessels to be fitted with IGS if high capacity fixed washing machines are fitted. Certain flexibility is permitted administrations concerning the suitability and practicability of fitting IGS on vessels between 20,000 and 40,000 DWT. There is no flexibility if the vessel is equipped with high capacity fixed washing machines (throughput of greater than 60 cubic meters per hour) or COW. The requirement then becomes mandatory.

INSPECTION AND CERTIFICATION

The working group on Inspection and Certification met for 4 days with representatives from 25 delegations and 3 observers from NGO's taking part. The US proposals called for:

(a) Provisions for Administrations to empower nongovernmental organizations and nominated surveyors to board ships, without the owner's permission, to conduct unscheduled inspections, require repairs and to carry out regular surveys and inspections of all cargo ships.

(b) Provisions requiring administrations to institute a program of unscheduled inspections on all cargo ships; the scope and frequency of such inspections to be developed by IMCO.

(c) Provisions requiring intermediate surveys on tankers 10 years of age and over to ensure that the ship and its equipment remain in compliance with the Cargo Ship Safety Equipment Certificate, Cargo Ship Safety Construction Certificate, and the Internaional Oil Pollution Prevention Certificate.

(d) Provisions defining the scope and frequency of various types of intermediate surveys.

(e) Provisions requiring that all ships be properly maintained between surveys and that masters, owners,

nominated surveyors, and recognized organizations report accidents or defects which affect the safety of the ships or persons on board, or endanger the marine environment to the flag state and to the port state where applicable.

(f) Provisions requiring that the nominated surveyor or recognized organization responsible for issuance of certificates be notified as well as the flag state consul or diplomatic representative in the event of intervention.

Principal alternatives or amendments were the introduction of:

(a) mandatory annual surveys being an acceptable alternative to unscheduled inspections, the scope of such surveys to be developed by IMCO.

(b) a provision for compensation to a ship for any loss or damage suffered if it has been unduly delayed by a port state.

After extensive discussions extending over four days, the working group agreed upon (and the Conference approved) the U.S. proposals plus the addition of the alternative to unscheduled inspections and the amendment providing for compensation for loss or damage from undue delay. See Appendix D.

IMPROVED EMERGENCY STEERING STANDARDS

The United States submitted a general proposal to improve the steering capability of new and existing oil tankers of 20,000 DWT or greater at the 3rd session of the Tanker Safety and Pollution Prevention working group of IMCO. The proposed improvement in steering capability should reduce the probability of collisions and grounding of tankers caused by steering failure and should, therefore, reduce the risk of oil pollution, property damage, personal injury and death that could result from such accidents.

The proposal would require each oil tanker of 20,000 DWT or more that uses a full follow-up type steering gear control system to have a steering failure alarm that would provide an audible and visible warning in the pilothouse. This proposed alarm system is to be separate of each steering gear control system on the vessel, thereby preventing failure of the alarm in the event of a failure of a component of the control system. If the vessel is steered by means other than the follow-up type, constant use of a rudder angle indicator is necessary; or if automatic steering gear control equipment is used, alarms are built into the equipment. In these means of steering, early warning of a steering failure is provided, precluding the need of such an additional warning.

The proposal would also require that a means be provided to recover control of the rudder within 45 seconds after detection of a failure of the steering gear control system in use. This may be accomplished with either two separate and independent steering gear control systems (including differential controllers) or procedures and associated equipment for manning the steering gear spaces or other alternative steering stations.

A working group on Improved Steering Standards for Tankers, requested by Committee II, met for four days with representatives of 13 nations and 2 NGO's taking part. The Working Group was tasked by Committee II to:

(a) consider improved steering standards for tankers,

(b) consider the need for improved training of personnel in set procedures,

(c) consider requirements for operational testing of steering gear equipment and control systems, and

(d) consider the draft resolution (Annex VII to MSC/MEPC/10) on improved steering gear standards.

The working group selected the Netherlands proposal as the basic working document taking into account proposals from the United States and the USSR, and documents submitted to the Conference. The U.S. received virtually no support for manning as an alternative to duplication of steering gear

control systems. Further, the working group did not include differential control units or follow-up linkage in the definition of control systems because of basic differences in design standards between U.S. vessels and those of other nations. Two primary reasons are:

(a) Many foreign vessels use a floating level unit for hydraulic pump control which typically is slow moving and not subject to the type of failure as experienced by other designs.

(b) Most foreign cargo vessels (including tankers) have steering gear designed so that both hydraulic pumps may be operated simultaneously to meet rudder movement standards. Duplication of pump control and follow-up hardware is difficult to design for these vessels so that both systems operate in tandem over the full range of control.

Strong support was given for duplication of control systems between the navigating bridge and the steering gear power unit controls, for both new and existing tankers, including those having telemotor (hydraulic) steering controls. Resolution A325(IX) would allow administrations to waive the requirement for a second independent control system for

vessels equipped with a hydraulic telemotor. Thus, the working group did not recommend this exemption for tankers.

No support was given for the control system failure alarm because the rudder angle indicator was believed to provide the same indication of failure and should remain the primary instrument relied upon by the helmsman.

The Netherlands proposal initially addressed oil tankers; however, the working group agreed that these standards should apply to all tankers, thus application is extended to gas carriers and chemical ships. The Conference approved the following improvements to steering gear standards for tankers of 10,000 gross tons and upwards:

For new and existing tankers:

(a) two remote steering gear control systems operable from the navigating bridge. In the event of failure of the remote steering gear control system in operation, the other system shall be capable of being brought into immediate operation from a position on the navigating bridge.

(b) control of the main steering gear shall also be provided in the steering gear compartment.

(c) means shall be provided in the steering gear compartment to disconnect the remote steering gear control system from the power circuit.

(d) a means of communication shall be provided between the navigating bridge and the steering gear compartment.

(e) the exact angular position of the rudder shall be indicated on the navigating bridge. The rudder angle indication shall be independent of the remote steering gear control system, and

(f) the angular position of the rudder shall be recognizable in the steering gear ccmpartment.

For new tankers:

(a) the main steering gear shall comprise two or more identical units.

(b) the main steering gear power units shall be arranged to start automatically when power is restored after a power failure.

(c) in the event of failure of any of the steering gear power units an alarm shall be given on the navigating bridge. Every steering gear power unit shall be capable of being brought into operation either automatically or manually from a position on the navigating bridge, and

(d) an alternative power supply, at least sufficient to supply a steering gear power unit so as to enable it to move the rudder at a specified rate and also to supply its associated remote steering gear control system and the rudder angle indicator, shall be provided.

The Conference approved additions to SOLAS 74, Chapter V, which include the following:

(a) testing of manual steering gear after prolonged use of the automatic pilot and before entering areas where navigation demands special caution,

(b) where navigation demands special caution, ships shall have more than one steering gear power unit in operation when such units are capable of simultaneous operation.

(c) checks and tests to be conducted within 12 hours before departure.

(d) certain emergency steering drills to be conducted at least once every three months.

The Conference approved a Resolution on Improved Emergency Steering Standards. The resolution requests the Organization as a matter of urgency to:

(a) redraft Resolution A325 (IX)

(b) make the steering standards in the 1978 protocol applicable also to ships other than tankers, and

(c) consider the contents of Resolution A325 (IX) as an amendment to SOLAS 74.

2ND RADAR AND COLLISION AVOIDANCE AIDS

The United States proposal would require all ships of 10,000 tons gross tonnage and upwards to be fitted with two radars each capable of operating independently of the other and each of a type approved by the Flag State. Primarily, this would provide a "back up" in the event of failure of the primary radar. Additionally, however, it would improve the information gather capability of the vessel by permitting one X-band and one S-band device, or by having one radar on long range for navigation while the other is on short range for maneuvering, or one for the pilot, one for the master/mate, etc.

The United States also proposed that all ships of 10,000 tons gross tonnage and upward be fitted with collision avoidance aids (CAA's) capable of operating in accordance with internationally agreed operational standards developed by the Organization (IMCO). The joint meeting of the MSC/MEPC was of the opinion that a mandatory requirement of such an aid would be premature at this stage until internationally agreed user requirements and operational performance standards for such aids have been developed. It was agreed that these standards should be prepared as a matter of urgency and when completed should be made a mandatory requirement. These standards shall be developed

by 1 July 1979. The U.S. did not agree with this position in its entirety, desiring that mandatory installation be required immediately upon standards development for the equipment.

The working group recommended and the Conference unanimously approved the provision to amend SOLAS, 1974 to provide two radars on all ships over 10,000 GRT. This will apply to new and existing vessels as well as to tankers and all ships other than tankers above 10,000 GRT. The Conference also unanimously approved a Resolution on the Carriage of Collision Avoidance Aids (CAA) to develop performance standards for such aids on all ships over 10,000 GRT so that SOLAS, 1974 can be amended at the earliest practicable time. The provision for a second radar was acheived with ease. The US attempt to have the provision for the mandatory carriage of CAA included in the protocol was unsuccessful due to the lack of IMCO approved standards and the fear of many that without such standards these sophisticated aids might actually prejudice safety of navigation. The inclusion of the date certain for preparation of standards, and the inclusion of the term "at the earliest practicable time" represent an extremely strong expression to achieve the U.S. position in this matter.

IMPLEMENTATION

Measures adopted by the Conference are included in Annexes to Protocols to the two major Conventions, MARPOL 73 and SOLAS 74, and as Resolutions adopted by the Conference. The Protocol to the 1973 Convention will be merged with its parent Convention, while the Protocol to the 1974 Convention will be a separate instrument.

The target date for the entry into force of the 1973 Convention, as modified by its Protocol, is June 1981. The target date for entry into force of the 1974 Convention is June 1979. The target dates for coming into force of these Conventions and the Protocols are the subject of Conference Resolutions 1 and 2, copies of which are attached as Appendices B and C. Each Resolution recommends strongly that all Governments concerned put the new requirements into effect by agreed-upon target dates, without waiting for entry into force of the Protocols. In this regard, the Coast Guard intends to construct regulatory implementation of these new requirements so that they come into force no later than the dates contained in the Resolutions and Protocols adopted by the Conference.

Footnote:

Throughout this paper, reference is made to working documents published by IMCO for use at the Conference (e.g., TSPP/CONF/7/16). These documents are on file at Coast Guard Headquarters. Requests for any of these should be forwarded to:

Commandant (G-MMT-1/82)

USCG Headquarters

400 7th St. S.W.

Washington, D.C. 20590

APPENDIX A

TSPP Conference Results
Ship Construction and Equipment Requirements

Tank Vessel		Requirement (Construction feature, Vessel tonnage, Date required)
New 6/79 Contract date 1/80 Keel laying 6/82 Delivery	Crude	PL SBT COW IGS — 20,000 DWT and over (Note 2) Second Radar CAA Steering — 10,000 GT and over at HS (6/79) (Note 1)
	Product	PL SBT — 30,000 DWT and over IGS — 20,000 DWT and over Second Radar CAA Steering — 10,000 GT and over at HS (6/79) (Note 1)
Existing	Crude	CBT or SBT or COW — 40,000 DWT and over at HM (6/81) → then → SBT or COW — 70,000 DWT and over at HM+2 (6/83); 40,000 to 70,000 DWT at HM+4 (6/85) IGS — 70,000 DWT and over at HS+2 (6/81); 20,000 to 70,000 DWT at HS+4 (6/83) (Note 3) Second Radar CAA — 10,000 GT and over at HS (6/79) Steering — 10,000 GT and over at HS+2 (6/81)
	Product	CBT or SBT — 40,000 DWT and over at HM (6/81) IGS — 70,000 DWT and over at HS+2 (6/81); 40,000 to 70,000 DWT at HS+4 (6/83) (Note 4) Second Radar CAA — 10,000 GT and over at HS (6/79) Steering — 10,000 GT and over at HS+2 (6/81)

Note: Dates in ( ) are dates by which Resolutions 1 and 2 adopted by the Conference recommend putting these requirements into effect, without waiting for entry into force of the Protocols.

TSPP Conference Results
Ship Construction and Equipment Requirements
Notes

1. Explanation of Terms.

CAA - Collision avoidance aids; performance standards are to be developed by 7/1/79. SOLAS 74, Chapter V, will then be amended to require CAA on all ships of 10,000 GT and over at a time to be agreed upon.

CBT - Dedicated clean ballast tanks. Existing tankers may operate with dedicated clean ballast tanks in accordance with the requirements of Regulation 13 and 13A of the MARPOL Protocol, and the Specifications in Resolution 14.

COW - Crude oil washing, to comply with the requirements of Regulation 13 and 13B of the MARPOL Protocol.

DWT - Deadweight Tonnage, the difference in metric tons between the displacement of a ship in water (specific gravity of 1.025) at the load waterline corresponding to the assigned summer freeboard and the displacement of a ship in metric tons without cargo, fuel oil, lubricating oil, ballast water, fresh water and feedwater in tanks, consumable stores, passengers and their effects.

GT - Gross Tonnage is the total measured cubic volume of a ship expressed in units of 100 cu.ft. with certain space exemptions.

MN - Date of entry into force of MARPOL Protocol (incorporating MARPOL 73 itself). Target date of 6/81 was established by Resolution 1. Dates in ( ) in Table 2 are dates by which Resolutions 1 and 2 recommended putting these requirements into effect, without waiting for entry into force of the Protocols.

NS - Date of entry into force of SOLAS Protocol. Target date of 6/79 was established by Resolution 2. Dates in ( ) in Table 2 are dates by which Resolutions 1 and 2 recommend putting these requirements into effect, without waiting for entry into force of the Protocols.

IGS - Inert gas system, to comply with SOLAS Protocol, Chapter II-2, Regulation 55 and 60.

PL - Protective location of segregated ballast tanks to provide protection of cargo spaces in case of collision or grounding, to comply with MARPOL Protocol, Regulation 13E.

SBT - Segregated ballast tanks, to comply with MARPOL Protocol, Regulation 13.

Second Radar - Requirement for at least two radars, each capable of operating independently of the other. SOLAS Protocol, Chapter V, Regulation 12.

Steering - Improvements to steering gear and steering gear control system requirements contained in SOLAS Protocol, Chapter II-1, Regulation 2 and 29, and changes to operating requirements (use of automatic pilot, steering testing and drills, etc.), in Chapter V, Regulation 19, 19-1, and 19-2. "Date required" given for existing tankers applies to modifications to steering gear; operating requirements may come into effect earlier.

2. An inert gas system is required whenever a tanker uses crude oil washing.

3. Between 20,000 and 40,000 DWT, the Administration of a Flag State may grant an exemption to the requirement for IGS if high capacity washing machines (i.e., tank washing machines having an individual throughput of greater than 60 cubic meters per hour) are not fitted and the ship's design characteristics make it impracticable to fit IGS.

4. Tonnage limit for IGS is to be reduced to 20,000 DWT if tank washing machines having an individual throughput of greater than 60 cubic meters per hour are fitted.

DRAFT RESOLUTION 1

TARGET DATE FOR THE ENTRY INTO FORCE OF THE PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973

THE CONFERENCE,

RECOGNIZING that the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973 (the MARPOL Protocol) when implemented, would substantially achieve the complete elimination of intentional pollution of the marine environment by oil and other harmful substances and the minimization of accidental discharge of such substances,

DESIRING to bring the MARPOL Protocol which incorporates and modifies the 1973 Convention into force as soon as possible,

TAKING NOTE of the work by the Inter-Governmental Maritime Consultative Organization to resolve the technical problems involved in the implementation of the Convention,

RECOMMENDS that all Governments concerned adopt a target date of June 1981 for the entry into force of the MARPOL Protocol which incorporates and modifies the 1973 Convention,

RECOMMENDS ALSO that those States which contemplate becoming Parties to the MARPOL Protocol:

(a) make every effort to deposit their instruments of ratification, approval, acceptance or accession at as early a date as possible but not later than June 1980;

(b) if they have not deposited such instruments before June 1980, give the Secretary-General of the Organization by that date an indication of the period within which they expect to be able to do so,

RECOMMENDS FURTHER that, prior to entry into force of the MARPOL Protocol, Governments should ensure that the provisions of that instrument are applied by the date fixed to new ships in respect of requirements which contain a specific implementation date,

NOTING that, with regard to existing oil tankers, the MARPOL Protocol prescribes that requirements should be implemented in relation to the date on which the Protocol enters into force,

INVITES all Governments concerned to put these requirements into effect, to the maximum extent, without waiting for the entry into force of the MARPOL Protocol, by June 1981, or as soon as possible thereafter, namely:

- for existing Crude Oil Tankers:

  Requirements for segregated ballast tanks, crude oil washing or dedicated clean ballast tanks contained in Regulation 13 of the MARPOL Protocol

- for existing Product Carriers:

  Requirements for segregated ballast tanks or dedicated clean ballast tanks contained in Regulation 13 of the MARPOL Protocol,

RECOMMENDS that the eleventh session of the Assembly of the Organization in 1979 review progress towards meeting those dates.

DRAFT RESOLUTION 2

TARGET DATE FOR THE ENTRY INTO FORCE OF THE PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

THE CONFERENCE,

RECOGNIZING that the International Convention for the Safety of Life at Sea, 1974 (SOLAS Convention) and the Protocol of 1978 relating to that Convention (SOLAS Protocol) when implemented, can make a significant improvement in the safety of ships and property at sea and the life of persons on board,

NOTING that the SOLAS Protocol adopted by the Conference cannot enter into force before the Convention enters into force,

DESIRING to bring the SOLAS Convention and the SOLAS Protocol into force as soon as possible,

RECOMMENDS that all Governments concerned adopt a target date of June 1979 for the entry into force of the SOLAS Convention and endeavour to ensure that the SOLAS Protocol enters into force at the same time or as soon as possible thereafter,

RECOMMENDS ALSO that those States which contemplate becoming Parties to the SOLAS Convention:

(a) make every effort to deposit their instruments of ratification, approval, acceptance, or accession at the earliest possible date, but not later than June 1978;

(b) deposit instruments of ratification, approval, or acceptance of, or accession to the SOLAS Protocol when it is open for signature or as soon as possible thereafter; and when it becomes possible to do so, endeavour to deposit instruments of ratification, approval, or acceptance of, or accession to, both the SOLAS Convention and the SOLAS Protocol simultaneously;

(c) if they have not deposited such instruments before June 1978, give the Secretary-General of the Inter-Governmental Maritime Consultative Organization by that date an indication of the period within which they expect to be able to do so,

RECOMMENDS ALSO that States which have deposited instruments of ratification of the SOLAS Convention should deposit instruments of ratification of the SOLAS Protocol as soon as possible,

RECOMMENDS FURTHER that, prior to entry into force of the SOLAS Protocol, Administrations should ensure that the provisions of that instrument are applied to new tankers by the date fixed in respect of requirements which contain a specific implementation date,

NOTING that, with regard to existing ships, the SOLAS Protocol prescribes that the requirements should be implemented in relation to the date on which that Protocol enters into force,

INVITES all Governments concerned to put these requirements into effect to the maximum extent, without waiting for the entry into force of the SOLAS Protocol by the following dates, or as soon as possible thereafter, namely:

- Requirements for inert gas systems contained in Regulation 60 of Chapter II-2 of the SOLAS Protocol

  Existing tankers of 70,000 tons deadweight and above: by June 1981

  Existing tankers of 40,000 tons deadweight and above but below 70,000 tons deadweight, and those of 20,000 tons and above but below 40,000 tons deadweight fitted with high capacity tank washing machines: by June 1983

- Requirements for steering gear for existing tankers: by June 1981,

RECOMMENDS that the eleventh session of the Assembly of the Inter-Governmental Maritime Consultative Organization in 1979 review progress towards meeting these dates.

APPENDIX D

TSPP Conference Results
Changes to Vessel Inspection and Certification Requirements

1978 Protocol amendments to SOLAS 74, Chapter 1, Part B

Regulation 6 Introduction of mandatory unscheduled inspections of all cargo ships, unless an administration opts to establish mandatory annual surveys. Guidelines for unscheduled inspections and annual surveys are to be developed under the aegis of IMCO.

Flag States, as a minimum, are to empower nominated surveyors or recognized organizations to require repairs to a ship, and to carry out inspections and surveys if requested by the appropriate Port State authorities.

Nominated surveyors or recognized organizations will be responsible for taking corrective action when they have determined a ship or its equipment does not correspond to the particulars of the certificate. If corrective action cannot be taken, the appropriate authorities of the Flag State and Port State are to be notified.

Regulation 8 Introduction of a requirement for the inspection of inert gas systems to be included as part of Cargo Safety Equipment Surveys.

Introduction of intermediate surveys (annual) on tankers of 10 years of age and over to ensure that lifesaving appliances and other equipment have been properly maintained in accordance with the Convention and Protocols. An endorsement of the Cargo Ship Safety Equipment Certificate is required at the successful completion of the intermediate survey.

Regulation 10 Introduction of mandatory surveys of all cargo ships, at intervals not exceeding 5 years, for issuance of a Cargo Ship Safety Construction Certificate.

Introduction of intermediate surveys of tankers 10 years of age and older during the period of validity (in the 3rd year) of the Cargo Ship Safety Construction Certificate. Endorsement of the Cargo Ship Safety Construction Certificate is required at the successful completion of the intermediate survey.

Identification of additional special areas on tankers which must be inspected during initial and periodic surveys prior to issuance of a Cargo Ship Safety Construction Certificate and during intermediate surveys. (These special areas include outside of a ship's bottom, pump rooms, cargo and bunker piping systems, vent piping, pressure-vacuum relief valves and flame screens, and electrical installation.)

Introduction of a mandatory requirement for general or partial surveys on all cargo ships whenever it has been determined by an investigation that the condition of the ship warrants the survey or whenever important repairs or renewals are made.

Regulation 11 Introduction of a specific requirement that the ship and its equipment shall be properly maintained.

Introduction of a requirement that the master or owner shall report accidents or defects which affect the safety of the ship or the efficiency or completeness of lifesaving appliances or other equipment to the Home Administration and to the recognized organization or nominated surveyor responsible for issuing the relevant certificate.

Introduction of a requirement that the Home Administration or the recognized organization or nominated surveyor initiate an investigation to determine if a survey is required upon receipt of a report of an accident or defect from the master or owner.

Introduction of a requirement that the master or owner shall also report accidents or defects to the port state when applicable and that the nominated surveyor or recognized organization shall ascertain that the master or owner has done so.

Regulation 19 Introduction of a new provision that certificates will not be accepted if the ship or its equipment is not properly maintained so as to be in compliance with the provisions of Regulation 11.

Introduction of a requirement that nominated surveyors or recognized organizations responsible for issuance of certificates shall be included in notification by a control officer in the case of a vessel intervention.

Introduction of a paragraph stating that a ship shall not be unduly delayed or detained and that if it is unduly detained or delayed it shall be entitled to compensation for any loss or damage suffered.

1978 Protocol amendments to MARPOL 73, Annex I, Chapter I

Regulation 4 Introduction of a requirement for the inspection of crude oil washing systems to be included as part of all surveys for issuance of an International Oil Pollution Prevention Certificate.

Introduction of the same new requirements outlined above for 1978 Protocol to SOLAS 74, Regulations 6 and 11.

Regulation 8 Deletion of the extension provisions for the International Oil Pollution Prevention Certificates; the period for which these certificates are valid cannot exceed five years.

APPENDIX 7

PROTOCOL OF 1978

RELATING TO THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973

PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973

THE PARTIES TO THE PRESENT PROTOCOL,

RECOGNIZING the significant contribution which can be made by the International Convention for the Prevention of Pollution from Ships, 1973, to the protection of the marine environment from pollution from ships,

RECOGNIZING ALSO the need to improve further the prevention and control of marine pollution from ships, particularly oil tankers,

RECOGNIZING FURTHER the need for implementing the Regulations for the Prevention of Pollution by Oil contained in Annex I of that Convention as early and as widely as possible,

ACKNOWLEDGING HOWEVER the need to defer the application of Annex II of that Convention until certain technical problems have been satisfactorily resolved,

CONSIDERING that these objectives may best be achieved by the conclusion of a Protocol relating to the International Convention for the Prevention of Pollution from Ships, 1973,

HAVE AGREED as follows:

ARTICLE I

General Obligations

1. The Parties to the present Protocol undertake to give effect to the provisions of:

   (a) the present Protocol and the Annex hereto which shall constitute an integral part of the present Protocol; and

   (b) the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as "the Convention"), subject to the modifications and additions set out in the present Protocol.

2. The provisions of the Convention and the present Protocol shall be read and interpreted together as one single instrument.

3. Every reference to the present Protocol constitutes at the same time a reference to the Annex hereto.

ARTICLE II

Implementation of Annex II of the Convention

1. Notwithstanding the provisions of Article 14(1) of the Convention, the Parties to the present Protocol agree that they shall not be bound by the provisions of Annex II of the Convention for a period of three years from the date of entry into force of the present Protocol or for such longer period as may be decided by a two-thirds majority of the Parties to the present Protocol in the Marine Environment Protection Committee (hereinafter referred to as "the Committee") of the Inter-Governmental Maritime Consultative Organization (hereinafter referred to as "the Organization").

2. During the period specified in paragraph 1 of this Article, the Parties to the present Protocol shall not be under any obligations nor entitled to claim any privileges under the Convention in respect of matters relating to Annex II of the Convention and all reference to Parties in the Convention shall not include the Parties to the present Protocol in so far as matters relating to that Annex are concerned.

ARTICLE III

Communication of Information

The text of Article 11(1)(b) of the Convention is replaced by the following:

"a list of nominated surveyors or recognized organizations which are authorized to act on their behalf in the administration of matters relating to the design, construction, equipment and operation of ships carrying harmful substances in accordance with the provisions of the Regulations for circulation to the Parties for information of their officers. The Administration shall therefore notify the Organization of the specific responsibilities and conditions of the authority delegated to nominated surveyors or recognized organizations."

ARTICLE IV

Signature, Ratification, Acceptance, Approval and Accession

1. The present Protocol shall be open for signature at the Headquarters of the Organization from 1 June 1978 to 31 May 1979 and shall thereafter remain open for accession. States may become Parties to the present Protocol by:

(a) signature without reservation as to ratification, acceptance or approval; or

(b) signature, subject to ratification, acceptance or approval, followed by ratification, acceptance or approval; or

(c) accession.

2. Ratification, acceptance, approval or accession shall be effected by the deposit of an instrument to that effect with the Secretary-General of the Organization.

ARTICLE V

Entry into Force

1. The present Protocol shall enter into force twelve months after the date on which not less than fifteen States, the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant shipping, have become Parties to it in accordance with Article IV of the present Protocol.

2. Any instrument of ratification, acceptance, approval or accession deposited after the date on which the present Protocol enters into force shall take effect three months after the date of deposit.

3. After the date on which an amendment to the present Protocol is deemed to have been accepted in accordance with Article 16 of the Convention, any instrument of ratification, acceptance, approval or accession deposited shall apply to the present Protocol as amended.

ARTICLE VI

Amendments

The procedures set out in Article 16 of the Convention in respect of amendments to the Articles, an Annex and an Appendix to an Annex of the Convention shall apply respectively to amendments to the Articles, the Annex and an Appendix to the Annex of the present Protocol.

ARTICLE VII

Denunciation

1. The present Protocol may be denounced by any Party to the present Protocol at any time after the expiry of five years from the date on which the Protocol enters into force for that Party.

2. Denunciation shall be effected by the deposit of an instrument of denunciation with the Secretary-General of the Organization.

3. A denunciation shall take effect twelve months after receipt of the notification by the Secretary-General of the Organization or after the expiry of any other longer period which may be indicated in the notification.

ARTICLE VIII

Depositary

1. The present Protocol shall be deposited with the Secretary-General of the Organization (hereinafter referred to as "the Depositary").

2. The Depositary shall:

(a) inform all States which have signed the present Protocol or acceded thereto of:

(i) each new signature or deposit of an instrument of ratification, acceptance, approval or accession, together with the date thereof;

(ii) the date of entry into force of the present Protocol;

(iii) the deposit of any instrument of denunciation of the present Protocol together with the date on which it was received and the date on which the denunciation takes effect;

(iv) any decision made in accordance with Article II(1) of the present Protocol;

(b) transmit certified true copies of the present Protocol to all States which have signed the present Protocol or acceded thereto.

3. As soon as the present Protocol enters into force, a certified true copy thereof shall be transmitted by the Depositary to the Secretariat of the United Nations for registration and publication in accordance with Article 102 of the Charter of the United Nations.

ARTICLE IX

Languages

The present Protocol is established in a single original in the English, French, Russian and Spanish languages, each text being equally authentic. Official translations in the Arabic, German, Italian and Japanese languages shall be prepared and deposited with the signed original.

IN WITNESS WHEREOF the undersigned being duly authorized by their respective Governments for that purpose have signed the present Protocol.

DONE AT LONDON this seventeenth day of February one thousand nine hundred and seventy-eight.

ANNEX

MODIFICATIONS AND ADDITIONS TO THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973

ANNEX I

REGULATIONS FOR THE PREVENTION OF POLLUTION BY OIL

Regulation 1

Definitions

Paragraphs (1) to (7) - No change

The existing text of paragraph (8) is replaced by the following:

(8) (a) 'Major conversion' means a conversion of an existing ship:

(i) which substantially alters the dimensions or carrying capacity of the ship; or

(ii) which changes the type of the ship; or

(iii) the intent of which in the opinion of the Administration is substantially to prolong its life; or

(iv) which otherwise so alters the ship that, if it were a new ship, it would become subject to relevant provisions of the present Protocol not applicable to it as an existing ship.

(b) Notwithstanding the provisions of sub-paragraph (a) of this paragraph, conversion of an existing oil tanker of 20,000 tons deadweight and above to meet the requirements of Regulation 13 of this Annex shall not be deemed to constitute a major conversion for the purposes of this Annex.

Paragraphs (9) to (22) - No change

The existing text of paragraph (23) is replaced by the following:

(23) 'Lightweight' means the displacement of a ship in metric tons without cargo, fuel, lubricating oil, ballast water, fresh water and feed water in tanks, consumable stores, and passengers and crew and their effects.

Paragraphs (24) and (25) - No change

The following paragraphs are added to the existing text:

(26) Notwithstanding the provisions of paragraph (6) of this Regulation, for the purposes of Regulations 13, 13B, 13E and 18(5) of this Annex, "new oil tanker" means an oil tanker:

(a) for which the building contract is placed after 1 June 1979; or

(b) in the absence of a building contract, the keel of which is laid, or which is at a similar stage of construction after 1 January 1980; or

(c) the delivery of which is after 1 June 1982; or

(d) which has undergone a major conversion:

(i) for which the contract is placed after 1 June 1979; or

(ii) in the absence of a contract, the construction work of which is begun after 1 January 1980; or

(iii) which is completed after 1 June 1982,

except that, for oil tankers of 70,000 tons deadweight and above, the definition in paragraph (6) of this Regulation shall apply for the purposes of Regulation 13(1) of this Annex.

(27) Notwithstanding the provisions of paragraph (7) of this Regulation, for the purposes of Regulations 13, 13A, 13B, 13C, 13D and 18(6) of this Annex, "existing oil tanker" means an oil tanker which is not a new oil tanker as defined in paragraph (26) of this Regulation.

(28) "Crude oil" means any liquid hydrocarbon mixture occurring naturally in the earth whether or not treated to render it suitable for transportation and includes:

(a) crude oil from which certain distillate fractions may have been removed; and

(b) crude oil to which certain distillate fractions may have been added.

(29) "Crude oil tanker" means an oil tanker engaged in the trade of carrying crude oil.

(30) "Product carrier" means an oil tanker engaged in the trade of carrying oil other than crude oil.

Regulations 2 and 3 - No change

Regulation 4

The existing text of Regulation 4 is replaced by the following:

Surveys and Inspections

(1) Every oil tanker of 150 tons gross tonnage and above, and every other ship of 400 tons gross tonnage and above shall be subject to the surveys specified below:

(a) An initial survey before the ship is put in service or before the Certificate required under Regulation 5 of this Annex is issued for the first time, which shall include a complete survey of its structure, equipment, systems, fittings, arrangements and material in so far as the ship is covered by this Annex. This survey shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with the applicable requirements of this Annex.

(b) Periodical surveys at intervals specified by the Administration, but not exceeding five years, which shall be such as to ensure that the structure, equipment, systems, fittings, arrangements and material fully comply with the requirements of this Annex.

(c) A minimum of one intermediate survey during the period of validity of the Certificate which shall be such as to ensure that the equipment and associated pump and piping systems, including oil discharge monitoring and control systems, crude oil washing systems, oily-water separating equipment and oil filtering systems, fully comply with the applicable requirements of this Annex and are in good working order. In cases where only one such intermediate survey is carried out in any one Certificate validity period, it shall be held not before six months prior to, nor later than six

months after the half-way date of the Certificate's period of validity. Such intermediate surveys shall be endorsed on the Certificate issued under Regulation 5 of this Annex.

(2) The Administration shall establish appropriate measures for ships which are not subject to the provisions of paragraph (1) of this Regulation in order to ensure that the applicable provisions of this Annex are complied with.

(3) (a) Surveys of ships as regards the enforcement of the provisions of this Annex shall be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it.

(b) The Administration shall institute arrangements for unscheduled inspections to be carried out during the period of validity of the Certificate. Such inspections shall ensure that the ship and its equipment remain in all respects satisfactory for the service for which the ship is intended. These inspections may be carried out by their own inspection services, or by nominated surveyors or by recognized organizations, or by other Parties upon request of the Administration. Where the Administration, under the provisions of paragraph (1) of this Regulation, establishes mandatory annual surveys, the above unscheduled inspections shall not be obligatory.

(c) An Administration nominating surveyors or recognizing organizations to conduct surveys and inspections as set forth in sub-paragraphs (a) and (b) of this paragraph, shall as a minimum empower any nominated surveyor or recognized organization to:

(i) require repairs to a ship; and

(ii) carry out surveys and inspections if requested by the appropriate authorities of a Port State.

The Administration shall notify the Organization of the specific responsibilities and conditions of the authority delegated to the nominated surveyors or recognized organizations, for circulation to Parties to the present Protocol for the information of their officers.

(d) When a nominated surveyor or recognized organization determines that the condition of the ship or its equipment does not correspond substantially with the particulars of the Certificate or is such that the ship is not fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment, such surveyor or organization shall immediately ensure that corrective action is taken and shall in due course notify the Administration. If such corrective action is not taken the Certificate should be withdrawn and the Administration shall be notified immediately; and if the ship is in a port of another Party, the appropriate authorities of the Port State shall also be notified immediately. When an officer of the Administration, a nominated surveyor or recognized organization has notified the appropriate authorities of the Port State, the Government of the Port State concerned shall give such officer, surveyor or organization any necessary assistance to carry out their obligations under this Regulation. When applicable, the Government of the Port State concerned shall take such steps as will ensure that the ship shall not sail until it can proceed to sea or leave the port for the purpose of proceeding to the nearest appropriate repair yard available without presenting an unreasonable threat of harm to the marine environment.

(e) In every case, the Administration concerned shall fully guarantee the completeness and efficiency of the survey and inspection and shall undertake to ensure the necessary arrangements to satisfy this obligation.

(4) (a) The condition of the ship and its equipment shall be maintained to conform with the provisions of the present Protocol to ensure that the ship in all respects will remain fit to proceed to sea without presenting an unreasonable threat of harm to the marine environment.

(b) After any survey of the ship under paragraph (1) of this Regulation has been completed, no change shall be made in the structure, equipment, systems, fittings, arrangements or material covered by the survey, without the sanction of the Administration, except the direct replacement of such equipment and fittings.

(c) Whenever an accident occurs to a ship or a defect is discovered which substantially affects the integrity of the ship or the efficiency or completeness of its equipment covered by this Annex the master or owner of the ship shall report at the earliest opportunity to the Administration, the recognized organization or the nominated surveyor responsible for issuing the relevant Certificate, who shall cause investigations to be initiated to determine whether a survey as required by paragraph (1) of this Regulation is necessary. If the ship is in a port of another Party, the master or owner shall also report immediately to the appropriate authorities of the Port State and the nominated surveyor or recognized organization shall ascertain that such report has been made.

Regulations 5, 6 and 7

In the existing text of these Regulations, delete all references to "(1973)" in relation to the International Oil Pollution Prevention Certificate.

Regulation 8

Duration of Certificate

The existing text of Regulation 8 is replaced by the following:

(1) An International Oil Pollution Prevention Certificate shall be issued for a period specified by the Administration, which shall not exceed five years from the date of issue, provided that in the case of an oil tanker operating with dedicated clean ballast tanks for a limited period specified in Regulation 13(9) of this Annex, the period of validity of the Certificate shall not exceed such specified period.

(2) A Certificate shall cease to be valid if significant alterations have taken place in the construction, equipment, systems, fittings, arrangements or material required without the sanction of the Administration, except the direct replacement of such equipment or fittings, or if intermediate surveys as specified by the Administration under Regulation 4(1)(c) of this Annex are not carried out.

(3) A Certificate issued to a ship shall also cease to be valid upon transfer of the ship to the flag of another State. A new Certificate shall only be issued when the Government issuing the new Certificate is fully satisfied that the ship is in full compliance with the requirements of Regulation 4(4)(a) and (b) of this Annex. In the case of a transfer between Parties, if requested within three months after the transfer has taken place, the Government of the Party whose flag the ship was formerly entitled to fly shall transmit as soon as possible to the Administration a copy of the Certificate carried by the ship before the transfer and, if available, a copy of the relevant survey report.

Regulations 9 to 12 - No change

The existing text of Regulation 13 is replaced by the following Regulations:

Regulation 13

Segregated Ballast Tanks, Dedicated Clean Ballast Tanks and Crude Oil Washing

Subject to the provisions of Regulations 13C and 13D of this Annex, oil tankers shall comply with the requirements of this Regulation.

New oil tankers of 20,000 tons deadweight and above

(1) Every new crude oil tanker of 20,000 tons deadweight and above and every new product carrier of 30,000 tons deadweight and above shall be provided with segregated ballast tanks and shall comply with paragraphs (2), (3) and (4), or paragraph (5) as appropriate, of this Regulation.

(2) The capacity of the segregated ballast tanks shall be so determined that the ship may operate safely on ballast voyages without recourse to the use of cargo tanks for water ballast except as provided for in paragraph (3) or (4) of this Regulation. In all cases, however, the capacity of segregated ballast tanks shall be at least such that, in any ballast condition at any part of the voyage, including the conditions consisting of lightweight plus segregated ballast only, the ship's draughts and trim can meet each of the following requirements:

(a) the moulded draught amidships (dm) in metres (without taking into account any ship's deformation) shall not be less than:

$$dm = 2.0 + 0.02L;$$

(b) the draughts at the forward and after perpendiculars shall correspond to those determined by the draught amidships (dm) as specified in sub-paragraph (a) of this paragraph, in association with the trim by the stern of not greater than 0.015L; and

(c) in any case the draught at the after perpendicular shall not be less than that which is necessary to obtain full immersion of the propeller(s).

(3) In no case shall ballast water be carried in cargo tanks except on those rare voyages when weather conditions are so severe that, in the opinion of the master, it is necessary to carry additional ballast water in cargo tanks for the safety of the ship. Such additional ballast water shall be processed and discharged in compliance with Regulation 9 of this Annex and in accordance with the requirements of Regulation 15 of this Annex and entry shall be made in the Oil Record Book referred to in Regulation 20 of this Annex.

(4) In the case of new crude oil tankers, the additional ballast permitted in paragraph (3) of this Regulation shall be carried in cargo tanks only if such tanks have been crude oil washed in accordance with Regulation 13B of this Annex before departure from an oil unloading port or terminal.

(5) Notwithstanding the provisions of paragraph (2) of this Regulation, the segregated ballast conditions for oil tankers less than 150 metres in length shall be to the satisfaction of the Administration.

(6) Every new crude oil tanker of 20,000 tons deadweight and above shall be fitted with a cargo tank cleaning system using crude oil washing. The Administration shall undertake to ensure that the system fully complies with the requirements of Regulation 13B of this Annex within one year after the tanker was first engaged in the trade of carrying crude oil or by the end of the third voyage carrying crude oil suitable for crude oil washing, whichever occurs later. Unless such oil tanker carries crude oil which is not suitable for crude oil washing, the oil tanker shall operate the system in accordance with the requirements of that Regulation.

ballast tanker, provided that it complies with the requirements of paragraphs (2) and (3), or paragraph (5) as appropriate, of this Regulation.

Regulation 13A

Requirements for Oil Tankers with Dedicated Clean Ballast Tanks

(1) An oil tanker operating with dedicated clean ballast tanks in accordance with the provisions of Regulation 13(9) or (10) of this Annex, shall have adequate tank capacity, dedicated solely to the carriage of clean ballast as defined in Regulation 1(16) of this Annex, to meet the requirements of Regulation 13(2) and (3) of this Annex.

(2) The arrangements and operational procedures for dedicated clean ballast tanks shall comply with the requirements established by the Administration. Such requirements shall contain at least all the provisions of the Specifications for Oil Tankers with Dedicated Clean Ballast Tanks adopted by the International Conference on Tanker Safety and Pollution Prevention, 1978, in Resolution 14 and as may be revised by the Organization.

(3) An oil tanker operating with dedicated clean ballast tanks shall be equipped with an oil content meter, approved by the Administration on the basis of specifications recommended by the Organization*, to enable supervision of the oil content in ballast water being discharged. The oil content meter shall be installed no later than at the first scheduled shipyard visit of the tanker following the entry into force of the present Protocol. Until such time as the oil content meter is installed, it shall immediately before discharge of ballast be established by examination of the ballast water from dedicated tanks that no contamination with oil has taken place.

(4) Every oil tanker operating with dedicated clean ballast tanks shall be provided with:

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* Reference is made to the Recommendation on International Performance and Test Specifications for Oily-Water Separating Equipment and Oil Content Meters adopted by the Organization by Resolution A.393(X).

Existing crude oil tankers of 40,000 tons deadweight and above

(7) Subject to the provisions of paragraphs (8) and (9) of this Regulation every existing crude oil tanker of 40,000 tons deadweight and above shall be provided with segregated ballast tanks and shall comply with the requirements of paragraphs (2) and (3) of this Regulation from the date of entry into force of the present Protocol.

(8) Existing crude oil tankers referred to in paragraph (7) of this Regulation may, in lieu of being provided with segregated ballast tanks, operate with a cargo tank cleaning procedure using crude oil washing in accordance with Regulation 13B of this Annex unless the crude oil tanker is intended to carry crude oil which is not suitable for crude oil washing.

(9) Existing crude oil tankers referred to in paragraph (7) or (8) of this Regulation may, in lieu of being provided with segregated ballast tanks or operating with a cargo tank cleaning procedure using crude oil washing, operate with dedicated clean ballast tanks in accordance with the provisions of Regulation 13A of this Annex for the following period:

(a) for crude oil tankers of 70,000 tons deadweight and above, until two years after the date of entry into force of the present Protocol; and

(b) for crude oil tankers of 40,000 tons deadweight and above but below 70,000 tons deadweight, until four years after the date of entry into force of the present Protocol.

Existing product carriers of 40,000 tons deadweight and above

(10) From the date of entry into force of the present Protocol, every existing product carrier of 40,000 tons deadweight and above shall be provided with segregated ballast tanks and shall comply with the requirements of paragraphs (2) and (3) of this Regulation, or, alternatively, operate with dedicated clean ballast tanks in accordance with the provisions of Regulation 13A of this Annex.

An oil tanker qualified as a segregated ballast oil tanker

(11) Any oil tanker which is not required to be provided with segregated ballast tanks in accordance with paragraph (1), (7) or (10) of this Regulation may, however, be qualified as a segregated

(a) a Dedicated Clean Ballast Tank Operation Manual detailing the system and specifying operational procedures. Such a Manual shall be to the satisfaction of the Administration and shall contain all the information set out in the Specifications referred to in paragraph (2) of this Regulation. If an alteration affecting the dedicated clean ballast tank system is made, the Operation Manual shall be revised accordingly; and

(b) a Supplement to the Oil Record Book referred to in Regulation 20 of this Annex as set out in Supplement 1 to Appendix III of this Annex. The Supplement shall be permanently attached to the Oil Record Book.

Regulation 13B

Requirements for Crude Oil Washing

(1) Every crude oil washing system required to be provided in accordance with Regulation 13(6) and (8) of this Annex shall comply with the requirements of this Regulation.

(2) The crude oil washing installation and associated equipment and arrangements shall comply with the requirements established by the Administration. Such requirements shall contain at least all the provisions of the Specifications for the Design, Operation and Control of Crude Oil Washing Systems adopted by the International Conference on Tanker Safety and Pollution Prevention, 1978, in Resolution 15 and as may be revised by the Organization.

(3) An inert gas system shall be provided in every cargo tank and slop tank in accordance with the appropriate Regulations of Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as modified and added to by the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974.

(4) With respect to the ballasting of cargo tanks, sufficient cargo tanks shall be crude oil washed prior to each ballast voyage in order that, taking into account the tanker's trading pattern and expected weather conditions, ballast water is put only into cargo tanks which have been crude oil washed.

(5) Every oil tanker operating with crude oil washing systems shall be provided with:

(a) an Operations and Equipment Manual detailing the system and equipment and specifying operational procedures. Such a Manual shall be to the satisfaction of the Administration and shall contain all the information set out in the Specifications referred to in paragraph (2) of this Regulation. If an alteration affecting the crude oil washing system is made, the Operations and Equipment Manual shall be revised accordingly; and

(b) a Supplement to the Oil Record Book referred to in Regulation 20 of this Annex as set out in Supplement 2 to Appendix III of this Annex. The Supplement shall be permanently attached to the Oil Record Book.

Regulation 13C

Existing Tankers Engaged in Specific Trades

(1) Subject to the provisions of paragraphs (2) and (3) of this Regulation, Regulation 13(7) to (10) of this Annex shall not apply to an existing oil tanker solely engaged in specific trades between:

(a) ports or terminals within a State Party to the present Protocol; or

(b) ports or terminals of States Parties to the present Protocol, where:

(i) the voyage is entirely within a Special Area as defined in Regulation 10(1) of this Annex; or

(ii) the voyage is entirely within other limits designated by the Organization.

(2) The provisions of paragraph (1) of this Regulation shall only apply when the ports or terminals where cargo is loaded on such voyages are provided with reception facilities adequate for the reception and treatment of all the ballast and tank washing water from oil tankers using them and all the following conditions are complied with:

(a) subject to the exceptions provided for in Regulation 11 of this Annex, all ballast water, including clean ballast water, and tank washing residues are retained on board and transferred to the reception facilities and the entry in the appropriate Sections of the Supplement to the Oil Record Book referred to in paragraph (3) of this Regulation is endorsed by the competent Port State authority;

(b) agreement has been reached between the Administration and the Governments of the Port States referred to in sub-paragraph (1)(a) or (b) of this Regulation concerning the use of an existing oil tanker for a specific trade;

(c) the adequacy of the reception facilities in accordance with the relevant provisions of this Annex at the ports or terminals referred to above, for the purpose of this Regulation, is approved by the Governments of the States Parties to the present Protocol within which such ports or terminals are situated; and

(d) the International Oil Pollution Prevention Certificate is endorsed to the effect that the oil tanker is solely engaged in such specific trade.

(3) Every oil tanker engaged in a specific trade shall be provided with a Supplement to the Oil Record Book referred to in Regulation 20 of this Annex as set out in Supplement 3 to Appendix III of this Annex. The Supplement shall be permanently attached to the Oil Record Book.

Regulation 13D

Existing Oil Tankers Having Special Ballast Arrangements

(1) Where an existing oil tanker is so constructed or operates in such a manner that it complies at all times with the draught and trim requirements set out in Regulation 13(2) of this Annex without recourse to the use of ballast water, it shall be deemed to comply with the segregated ballast tank requirements referred to in Regulation 13(7) of this Annex, provided that all of the following conditions are complied with:

(a) operational procedures and ballast arrangements are approved by the Administration;

(b) agreement is reached between the Administration and the Governments of the Port States Parties to the present Protocol concerned when the draught and trim requirements are achieved through an operational procedure; and

(c) the International Oil Pollution Prevention Certificate is endorsed to the effect that the oil tanker is operating with special ballast arrangements.

(2) In no case shall ballast water be carried in oil tanks except on those rare voyages when weather conditions are so severe that, in the opinion of the master, it is necessary to carry additional ballast water in cargo tanks for the safety of the ship. Such additional ballast water shall be processed and discharged in compliance with Regulation 9 of this Annex and in accordance with the requirements of Regulation 15 of this Annex, and entry shall be made in the Oil Record Book referred to in Regulation 20 of this Annex.

(3) An Administration which has endorsed a Certificate in accordance with sub-paragraph (1)(c) of this Regulation shall communicate to the Organization the particulars thereof for circulation to the Parties to the present Protocol.

Regulation 13E

Protective Location of Segregated Ballast Spaces

(1) In every new crude oil tanker of 20,000 tons deadweight and above and every new product carrier of 30,000 tons deadweight and above, the segregated ballast tanks required to provide the capacity to comply with the requirements of Regulation 13 of this Annex which are located within the cargo tank length, shall be arranged in accordance with the requirements of paragraphs (2), (3) and (4) of this Regulation to provide a measure of protection against oil outflow in the event of grounding or collision.

(2) Segregated ballast tanks and spaces other than oil tanks within the cargo tank length (L_t) shall be so arranged as to comply with the following requirement:

$$\Sigma PA_c + \Sigma PA_s \geq J[L_t (B + 2D)]$$

where: PA_c = the side shell area in square metres for each segregated ballast tank or space other than an oil tank based on projected moulded dimensions,

PA_s = the bottom shell area in square metres for each such tank or space based on projected mould dimensions,

L_t = length in metres between the forward and after extremities of the cargo tanks,

B = maximum breadth of the ship in metres as defined in Regulation 1(21) of this Annex,

D = moulded depth in metres measured vertically from the top of the keel to the top of the freeboard deck beam at side amidships. In ships having rounded gunwales, the moulded depth shall be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design,

J = 0.45 for oil tankers of 20,000 tons deadweight
0.30 for oil tankers of 200,000 tons deadweight and above, subject to the provisions of paragraph (3) of this Regulation.

For intermediate values of deadweight the value of "J" shall be determined by linear interpolation.

Whenever symbols given in this paragraph appear in this Regulation, they have the meaning as defined in this paragraph.

(3) For tankers of 200,000 tons deadweight and above the value of "J" may be reduced as follows:

$$J \text{ reduced} = \left[J - \left(a - \frac{O_c + O_s}{4\, O_A} \right) \right] \text{ or } 0.2 \text{ whichever is greater}$$

where: a = 0.25 for oil tankers of 200,000 tons deadweight

a = 0.40 for oil tankers of 300,000 tons deadweight

a = 0.50 for oil tankers of 420,000 tons deadweight and above,

For intermediate values of deadweight the value of "a" shall be determined by linear interpolation.

O_c = as defined in Regulation 23(1)(a) of this Annex,

O_s = as defined in Regulation 23(1)(b) of this Annex,

O_A = the allowable oil outflow as required by Regulation 24(2) of this Annex.

(4) In the determination of "PA_c" and "PA_s" for segregated ballast tanks and spaces other than oil tanks the following shall apply:

(a) the minimum width of each wing tank or space either of which extends for the full depth of the ship's side or from the deck to the top of the double bottom shall be not less than 2 metres. The width shall be measured inboard from the ship's side at right angles to the centre line. Where a lesser width is provided the wing tank or space shall not be taken into account when calculating the protecting area "PA_c"; and

(b) the minimum vertical depth of each double bottom tank or space shall be B/15 or 2 metres, whichever is the lesser. Where a lesser depth is provided the bottom tank or space shall not be taken into account when calculating the protecting area "PA_s".

The minimum width and depth of wing tanks and double bottom tanks shall be measured clear of the bilge area and, in the case of minimum width, shall be measured clear of any rounded gunwale area.

Regulation 14 - No change

Regulation 15

In the existing text of this Regulation, delete reference to "(1973)" in relation to the International Oil Pollution Prevention Certificate.

Regulations 16 and 17 - No change

Regulation 18

Pumping, Piping and Discharge Arrangements of Oil Tankers

Paragraphs (1) to (4) - No change

The following paragraphs are added to the existing text:

(5) Every new oil tanker required to be provided with segregated ballast tanks, or fitted with a crude oil washing system shall comply with the following requirements:

(a) it shall be equipped with oil piping so designed and installed such that oil retention in the lines is minimized; and

(b) means shall be provided to drain all cargo pumps and all oil lines at the completion of cargo discharge, where necessary by connexion to a stripping device. The line and pump drainings shall be capable of being discharged both ashore and to a cargo tank or a slop tank. For discharge ashore a special small diameter line shall be provided for that purpose and connected outboard of the ship's manifold valves.

(6) Every existing crude oil carrier required to be provided with segregated ballast tanks, or fitted with a crude oil washing system or operated with dedicated clean ballast tanks, shall comply with the provisions of paragraph (5)(b) of this Regulation.

Regulation 19 - No change

Regulation 20

In the existing text of this Regulation, delete reference to "(1973)" in relation to the International Oil Pollution Prevention Certificate.

Regulations 21 to 25 - No change

Appendix I - LIST OF OILS

No change

Appendix II - FORM OF CERTIFICATE

The existing form of Certificate is replaced by the following form:

INTERNATIONAL OIL POLLUTION PREVENTION CERTIFICATE

Issued under the provisions of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, under the Authority of the Government of

.....
(full designation of the country)

by .....
(full designation of the competent person or organization authorized under the provisions of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973)

Name of Ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage

Type of ship:

Crude oil tanker*

Product carrier*

Crude oil/product carrier*

Ship other than an oil tanker with cargo tanks coming under Regulation 2(2) of Annex I of the Protocol*

Ship other than any of the above*

Date of building or major conversion contract .....

Date on which keel was laid or ship was at a similar stage of construction or on which major conversion was commenced .....

Date of delivery or completion of major conversion .....

---

* Delete as appropriate.

PART A ALL SHIPS

The ship is equipped with:

for ships of 400 tons gross tonnage and above:

(a) oily-water separating equipment* (capable of producing effluent with an oil content not exceeding 100 parts per million)

(b) an oil filtering system* (capable of producing effluent with an oil content not exceeding 100 parts per million)

for ships of 10,000 tons gross tonnage and above:

(c) an oil discharge monitoring and control system* (additional to (a) or (b) above) or

(d) oily-water separating equipment and an oil filtering system* (capable of producing effluent with an oil content not exceeding 15 parts per million) in lieu of (a) or (b) above.

Particulars of requirements from which exemption is granted under Regulation 2(2) and 2(4)(a) of Annex I of the Protocol:

.....

.....

Remarks:

---

* Delete as appropriate.

Endorsement for existing ships*

This is to certify that this ship has now been so equipped as to comply with the requirements of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, as relating to existing ships**

Signed .....
(Signature of duly authorized official)

Place .....

Date .....
(Seal or stamp of the Authority, as appropriate)

---

* This entry need not be reproduced on a Certificate other than the first Certificate issued to any ship.

** The period after the entry into force of the Protocol within which oily-water separating equipment, oil discharge control systems, oil filtering systems and/or slop tank arrangements must be provided is set out in Regulations 13A(3), 15(1) and 16(4) of Annex I of the Protocol.

PART B OIL TANKERS*

Carrying Capacity of Ship (m3)	Deadweight of Ship (metric tons)	Length of Ship (m)

It is certified that this ship is constructed and equipped, and must operate, in accordance with the following:

1. This ship is:

   (a) required to be constructed according to and complies with**

   (b) not required to be constructed according to**

   (c) not required to be constructed according to, but complies with**

   the requirements of Regulation 24 of Annex I of the Protocol.

2. This ship is:

   (a) required to be constructed according to and complies with**

   (b) not required to be constructed according to**

   the requirements of Regulation 13E of Annex I of the Protocol.

---

* This Part should be completed for oil tankers including combination carriers, and those entries which are applicable should be completed for ships other than oil tankers which are constructed and utilized to carry oil in bulk of an aggregate capacity of 200 cubic metres or above.

** Delete as appropriate.

3. This ship is:

(a) required to be provided with segregated ballast tanks according to, and complies with*

(b) not required to be provided with segregated ballast tanks according to*

(c) not required to be provided with segregated ballast tanks according to, but complies with*

(d) in accordance with Regulation 13C or 13D of Annex I of the Protocol, and as specified in Part C of this Certificate, exempted from*

the requirements of Regulation 13 of Annex I of the Protocol

(e) fitted with a cargo tank cleaning system using crude oil washing in accordance with the provisions of Regulation 13B of Annex I of the Protocol, in lieu of being provided with segregated ballast tanks*

(f) provided with dedicated clean ballast tanks in accordance with the provisions of Regulation 13A of Annex I of the Protocol, in lieu of being either provided with segregated ballast tanks or fitted with a cargo tank cleaning system using crude oil washing*

---

* Delete as appropriate.

4. This ship is:

(a) required to be fitted with a cargo tank cleaning system using crude oil washing according to, and complies with*

(b) not required to be fitted with a cargo tank cleaning system using crude oil washing according to*

the requirements of Regulation 13(6) of Annex I of the Protocol.

Segregated ballast tanks**

The segregated ballast tanks are distributed as follows:

Tank	Volume (m^3)	Tank	Volume (m^3)

Dedicated Clean Ballast Tanks**

This ship is operating with dedicated clean ballast tanks until ..... (date) in accordance with the requirements of Regulation 13A of Annex I of the Protocol.

The dedicated clean ballast tanks are designated as follows:

Tank	Volume (m^3)	Tank	Volume (m^3)

* Delete as appropriate.

** Delete if not applicable.

Manual*

This is to certify that this ship has been supplied with:

(a) a valid Dedicated Clean Ballast Tank Operation Manual in accordance with Regulation 13A of Annex I of the Protocol**

(b) a valid Operations and Equipment Manual for Crude Oil Washing in accordance with Regulation 13B of Annex I of the Protocol**

Identification of the valid Manual .....

Signed: .....
(Signature of duly authorized official)

Place: .....

Date: .....

(Seal or stamp of the Authority, as appropriate)

Identification of the valid Manual .....

Signed: .....
(Signature of duly authorized official)

Place: .....

Date: .....

(Seal or stamp of the Authority, as appropriate)

---

* Delete if not applicable.

** Delete as appropriate.

PART C EXEMPTIONS*

This is to certify that this ship is:

(a) solely engaged in trade between ..... and ..... in accordance with Regulation 13C of Annex I of the Protocol**; or

(b) operating with special ballast arrangements in accordance with Regulation 13D of Annex I of the Protocol**

and is therefore exempted from the requirements of Regulation 13 of Annex I of the Protocol.

Signed .....
(Signature of duly authorized official)

Place .....

Date .....

(Seal or stamp of the Authority, as appropriate)

---

* Delete if not applicable.

** Delete as appropriate.

THIS IS TO CERTIFY:

That the ship has been surveyed in accordance with Regulation 4 of Annex I of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, concerning the prevention of pollution by oil; and

that the survey shows that the structure, equipment, systems, fittings, arrangement and material of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the applicable requirements of Annex I of that Protocol.

This Certificate is valid until .....

subject to intermediate survey(s) at intervals of .....

Issued at .....
(Place of issue of Certificate)

..... 19 ....
(Signature of duly authorized official)

(Seal or stamp of the Authority, as appropriate)

INTERMEDIATE SURVEY

This is to certify that at an intermediate survey required by Regulation 4(1)(c) of Annex I of the Protocol 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, this ship and the condition thereof were found to comply with the relevant provisions of that Protocol.

Signed .....
(Signature of duly authorized official)

Place .....

Date .....

Next intermediate survey due .....

(Seal or stamp of the Authority, as appropriate)

Signed .....
(Signature of duly authorized official)

Place .....

Date .....

Next intermediate survey due .....

(Seal or stamp of the Authority, as appropriate)

Signed .....
(Signature of duly authorized official)

Place .....

Date .....

Next intermediate survey due .....

(Seal or stamp of the Authority, as appropriate)

Signed .....
(Signature of duly authorized official)

Place .....

Date .....

(Seal or stamp of the Authority, as appropriate)

Appendix III

FORM OF OIL RECORD BOOK

The following forms of Supplements to the Oil Record Book are added to the existing form:

Supplement 1

FORM OF SUPPLEMENT TO OIL RECORD BOOK FOR OIL TANKERS OPERATED WITH DEDICATED CLEAN BALLAST TANKS*

Name of ship .....

Distinctive number or letters .....

Total cargo carrying capacity ..... cubic metres

Total dedicated clean ballast capacity ..... cubic metres

The following tanks are designated as dedicated clean ballast tanks:

Tank	Volume (m^3)	Tank	Volume (m^3)

NOTE: The periods covered by the Supplement should be consistent with the periods covered by the Oil Record Book.

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* This Supplement should be attached to the Oil Record Book for oil tankers operating with dedicated clean ballast tanks in accordance with Regulation 13A of Annex I of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973. Other information as required should be entered in the Oil Record Book.

(A) Ballasting of dedicated clean ballast tanks

101.	Identity of tank(s) ballasted			
102.	Date and position of ship when water intended for flushing, or port ballast was taken to dedicated clean ballast tank(s)			
103.	Date and position of ship when pump(s) and lines were flushed to slop tank			
104.	Date and position of ship when additional ballast water was taken to dedicated clean ballast tank(s)			
105.	Date, time and position of ship when (a) valves to slop tank, (b) valves to cargo tanks, (c) other valves affecting the clean ballast system were closed			
106.	Quantity of clean ballast taken on board			

The undersigned certifies that, in addition to the above, all sea valves, cargo tank and pipeline connexions and connexions between tanks or inter-tank connexions, were secured on the completion of ballasting of dedicated clean ballast tanks.

Date of entry ..... Officer in charge .....

Master .....

(B) Discharge of clean ballast

107.	Identity of tank(s)			
108.	Date, time and position of ship at start of discharge of clean ballast (a) to sea, or (b) into reception facility			
109.	Date, time and position of ship upon completion of discharge to sea			
110.	Quantity discharged (a) to sea, or (b) into reception facility			
111.	Was the ballast water checked for oil contamination before discharge?			
112.	Was the discharge monitored during discharge by an oil content meter?			
113.	Was there any indication of oil contamination of the ballast water before or during discharge?			
114.	Date and position of ship when pump and lines were flushed after loading			
115.	Date, time and position of ship when (a) valves to slop tank, (b) valves to cargo tanks, (c) other valves affecting the clean ballast system were closed			
116.	Quantity of polluted water transferred to slop tank(s). (Identify slop tank(s))			

The undersigned certifies that, in addition to the above, all sea valves overboard discharge valves, cargo tank and pipeline connexions and connexions between tanks or inter-tank connexions, were secured on completion of discharge of clean ballast and that the pump(s) and pipes designated for clean ballast operations were properly cleaned upon completion of discharge of clean ballast.

Date of entry ..... Officer in charge .....

Master .....

Supplement 2

FORM OF SUPPLEMENT TO OIL RECORD BOOK FOR CRUDE OIL TANKERS OPERATING WITH A CARGO TANK CLEANING PROCEDURE USING CRUDE OIL WASHING*

Name of ship .....

Distinctive number or letters .....

Total cargo carrying capacity ..... cubic metres

Voyage from .... to ....
(Port(s)) (date) (Port(s)) (date)

NOTES: The periods covered by the supplement should be consistent with the periods covered by the Oil Record Book.

The cargo tanks crude oil washed should be those laid down in the Operations and Equipment Manual required by Regulation 13B(5)(a) of the Protocol.

A separate column should be used for each tank washed or water rinsed.

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* This Supplement should be attached to the Oil Record Book for crude oil tankers operating with a cargo tank cleaning procedure using crude oil washing in accordance with Regulation 13B of Annex I of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, and is intended to replace Section (e) of the Oil Record Book. Details of ballasting and deballasting and other information required should be entered in the Oil Record Book.

(A) Crude oil washing

201.	Date when and port where crude oil washing was carried out or ship's position if carried out between two discharge ports				
202.	Identity of tank(s) washed (see Note 1)				
203.	Number of machines in use				
204.	Commenced washing (a) date and time (b) ullage				
205.	Washing pattern employed (see Note 2)				
206.	Washing line pressure				
207.	Completed or stopped washing (a) date and time (b) ullage				
208.	Remarks				

The tanks were washed in accordance with programmes given in the Operations and Equipment Manual (see Note 3) and confirmed dry on completion.

Date of entry ..... Officer in charge .....

Master .....

Note 1 When an individual tank has more machines than can be operated simultaneously, as described in the Operations and Equipment Manual, then the section being crude oil washed should be identified, e.g. No.2 centre, forward section.

Note 2 In accordance with the Operations and Equipment Manual, enter whether single-stage or multi-stage method of washing is employed. If multi-stage method is used, give the vertical arc covered by the machines and the number of times that arc is covered for that particular stage of the programme.

Note 3 If the programmes given in the Operations and Equipment Manual are not followed, then details must be given under Remarks.

(B) Water rinsing or flushing of tank bottoms

209.	Date and position of ship when rinsing or flushing was carried out				
210.	Identity of tank(s) and date				
211.	Volume of water used				
212.	Transferred to: (a) reception facilities (b) slop tank(s) (identify slop tank(s))				

Date of entry ..... Officer in charge .....

Master .....

Supplement 3

FORM OF SUPPLEMENT TO OIL RECORD BOOK
FOR OIL TANKERS ENGAGED IN
SPECIFIC TRADES*

Name of ship .....

Distinctive number or letters .....

Total cargo carrying capacity ..... cubic metres

Total ballast water capacity required for compliance with Regulation 13(2) and (3) of Annex I of the Protocol ..... cubic metres

Voyages from ..... to .....
(Port(s)) (Port(s))

NOTE: The periods covered by the Supplement should be consistent with the periods covered by the Oil Record Book.

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* This Supplement should be attached to the Oil Record Book for oil tankers engaged in specific trades in accordance with Regulation 13C of Annex I of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, and is intended to replace Sections (d), (f), (g) and (i) of the Oil Record Book. Other information required should be entered in the Oil Record Book.

(A) Loading of ballast water

301.	Identity of tank(s) ballasted				
302.	Date and position of ship when ballasted				
303.	Total quantity of ballast loaded in cubic metres				
304.	Method of calculating ballast quantity				
305.	Remarks				
306.	Date and signature of officer in charge				
307.	Date and signature of Master				

(B) Re-allocation of ballast water within the ship

308.	Reason for re-allocation				
309.	Date and signature of officer in charge				
310.	Date and signature of Master				

(C) Ballast water discharge to reception facility

311.	Date and port(s) where ballast water was discharged				
312.	Name or designation of reception facility				
313.	Total quantity of ballast water discharged in cubic metres				
314.	Method of calculating ballast quantity				
315.	Date and signature of officer in charge				
316.	Date and signature of Master				
317.	Date, signature and stamp of port authority official				

ANNEX II

REGULATIONS FOR THE CONTROL OF POLLUTION BY NOXIOUS LIQUID SUBSTANCES IN BULK

No change

ANNEX III

REGULATIONS FOR THE PREVENTION OF POLLUTION BY HARMFUL SUBSTANCES CARRIED BY SEA IN PACKAGED FORMS, OR IN FREIGHT CONTAINERS, PORTABLE TANKS OR ROAD AND RAIL TANK WAGONS

No change

ANNEX IV

REGULATIONS FOR THE PREVENTION OF POLLUTION BY SEWAGE FROM SHIPS

No change

ANNEX V

REGULATIONS FOR THE PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS

No change

Certified true copy of the English text of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973 done at London on 17 February 1978, the original of which is deposited with the Secretary-General of the Inter-Governmental Maritime Consultative Organization.

For the Secretary-General of the Inter-Governmental Maritime Consultative Organization:

Thomas S. Bucha

London, 2. III. '78

APPENDIX 8

PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

THE PARTIES TO THE PRESENT PROTOCOL,

BEING PARTIES to the International Convention for the Safety of Life at Sea, 1974, done at London on 1 November 1974,

RECOGNIZING the significant contribution which can be made by the above-mentioned Convention to the promotion of the safety of ships and property at sea and the lives of persons on board,

RECOGNIZING ALSO the need to improve further the safety of ships, particularly tankers,

CONSIDERING that this objective may best be achieved by the conclusion of a Protocol relating to the International Convention for the Safety of Life at Sea, 1974,

HAVE AGREED as follows:

ARTICLE I

General Obligations

The Parties to the present Protocol undertake to give effect to the provisions of the present Protocol and the Annex hereto which shall constitute an integral part of the present Protocol. Every reference to the present Protocol constitutes at the same time a reference to the Annex hereto.

ARTICLE II

Application

1. The provisions of Articles II, III (other than paragraph (a)), IV, VI(b), (c) and (d), VII and VIII of the International Convention for the Safety of Life at Sea, 1974 (hereinafter referred to as "the Convention") are incorporated in the present Protocol, provided that references in those Articles to the Convention and to Contracting Governments shall be taken to mean references to the present Protocol and to the Parties to the present Protocol, respectively.

2. Any ship to which the present Protocol applies shall comply with the provisions of the Convention, subject to the modifications and additions set out in the present Protocol.

3. With respect to the ships of non-parties to the Convention and the present Protocol, the Parties to the present Protocol shall apply the requirements of the Convention and the present Protocol as may be necessary to ensure that no more favourable treatment is given to such ships.

ARTICLE III

Communication of Information

The Parties to the present Protocol undertake to communicate to, and deposit with, the Secretary-General of the Inter-Governmental Maritime Consultative Organization (hereinafter referred to as "the Organization"), a list of nominated surveyors or recognized organizations which are authorized to act on their behalf in the administration of measures for safety of life at sea for circulation to the Parties for information of their officers. The Administration shall therefore notify the Organization of the specific responsibilities and conditions of the authority delegated to the nominated surveyors or recognized organizations.

ARTICLE IV

Signature, Ratification, Acceptance, Approval and Accession

1. The present Protocol shall be open for signature at the Headquarters of the Organization from 1 June 1978 to 1 March 1979 and shall thereafter remain open for accession. Subject to the provisions of paragraph 3 of this Article, States may become Parties to the present Protocol by:

(a) signature without reservation as to ratification, acceptance or approval; or

(b) signature subject to ratification, acceptance or approval, followed by ratification, acceptance or approval; or

(c) accession.

2. Ratification, acceptance, approval or accession shall be effected by the deposit of an instrument to that effect with the Secretary-General of the Organization.

3. The present Protocol may be signed without reservation, ratified, accepted, approved or acceded to only by States which have signed without reservation, ratified, accepted, approved or acceded to the Convention.

ARTICLE V

Entry into Force

1. The present Protocol shall enter into force six months after the date on which not less than fifteen States, the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant shipping, have become Parties to it in accordance with Article IV of the present Protocol, provided however that the present Protocol shall not enter into force before the Convention has entered into force.

2. Any instrument of ratification, acceptance, approval or accession deposited after the date on which the present Protocol enters into force shall take effect three months after the date of deposit.

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3. After the date on which an amendment to the present Protocol is deemed to have been accepted under Article VIII of the Convention, any instrument of ratification, acceptance, approval or accession deposited shall apply to the present Protocol as amended.

ARTICLE VI

Denunciation

1. The present Protocol may be denounced by any Party at any time after the expiry of five years from the date on which the present Protocol enters into force for that Party.

2. Denunciation shall be effected by the deposit of an instrument of denunciation with the Secretary-General of the Organization.

3. A denunciation shall take effect one year, or such longer period as may be specified in the instrument of denunciation, after its receipt by the Secretary-General of the Organization.

4. A denunciation of the Convention by a Party shall be deemed to be a denunciation of the present Protocol by that Party.

ARTICLE VII

Depositary

1. The present Protocol shall be deposited with the Secretary-General of the Organization (hereinafter referred to as "the Depositary").

2. The Depositary shall:

(a) inform all States which have signed the present Protocol or acceded thereto of:

(i) each new signature or deposit of an instrument of ratification, acceptance, approval or accession, together with the date thereof;

(ii) the date of entry into force of the present Protocol;

(iii) the deposit of any instrument of denunciation of the present Protocol together with the date on which it was received and the date on which the denunciation takes effect;

(b) transmit certified true copies of the present Protocol to all States which have signed the present Protocol or acceded thereto.

3. As soon as the present Protocol enters into force, a certified true copy thereof shall be transmitted by the Depositary to the Secretariat of the United Nations for registration and publication in accordance with Article 102 of the Charter of the United Nations.

ARTICLE VIII

Languages

The present Protocol is established in a single original in the Chinese, English, French, Russian and Spanish languages, each text being equally authentic. Official translations in the Arabic, German and Italian languages shall be prepared and deposited with the signed original.

IN WITNESS WHEREOF the undersigned being duly authorized by their respective Governments for that purpose have signed the present Protocol.

DONE AT LONDON this seventeenth day of February one thousand nine hundred and seventy-eight.

ANNEX

MODIFICATIONS AND ADDITIONS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

CHAPTER I

GENERAL PROVISIONS

PART A - APPLICATION, DEFINITIONS, ETC.

Regulation 2

Definitions

The following paragraph is added to the existing text:

(n) "Age of a ship" means the elapsed period of time determined from the year of build as indicated on the ship's registry papers.

PART B - SURVEYS AND CERTIFICATES

Regulation 6

Inspection and Survey

The existing text of Regulation 6 is replaced by the following:

(a) The inspection and survey of ships, so far as regards the enforcement of the provisions of the present Regulations and the granting of exemptions therefrom, shall be carried out by officers of the Administration. The Administration may, however, entrust the inspections and surveys either to surveyors nominated for the purpose or to organizations recognized by it.

(b) The Administration shall institute arrangements for unscheduled inspections to be carried out during the period of validity of the certificate. Such inspections shall ensure that the ship and its equipment remain in all respects satisfactory for the service for which the ship is intended. These inspections may be carried out by the Administration's own inspection services, or by nominated surveyors, or

by recognized organizations, or by other Parties upon request of the Administration. Where the Administration, under the provisions of Regulations 8 and 10 of this Chapter, establishes mandatory annual surveys, the above unscheduled inspections shall not be obligatory.

(c) An Administration nominating surveyors or recognizing organizations to conduct inspections and surveys as set forth in paragraphs (a) and (b) of this Regulation shall as a minimum empower any nominated surveyor or recognized organization to:

(i) require repairs to a ship, and

(ii) carry out inspections and surveys if requested by the appropriate authorities of a Port State.

The Administration shall notify the Organization of the specific responsibilities and conditions of the authority delegated to nominated surveyors or recognized organizations.

(d) When a nominated surveyor or recognized organization determines that the condition of the ship or its equipment does not correspond substantially with the particulars of the certificate or is such that the ship is not fit to proceed to sea without danger to the ship, or persons on board, such surveyor or organization shall immediately ensure that corrective action is taken and shall in due course notify the Administration. If such corrective action is not taken the relevant certificate should be withdrawn and the Administration shall be notified immediately; and, if the ship is in the port of another Party, the appropriate authorities of the Port State shall also be notified immediately. When an officer of the Administration, a nominated surveyor or recognized organization has notified the appropriate authorities of the Port State, the Government of the Port State concerned shall give such officer, surveyor or organization any necessary assistance to carry out their obligations under this Regulation. When applicable, the Government of the Port State concerned shall ensure that the ship shall not sail until it can proceed to sea, or leave port for the purpose of proceeding to the appropriate repair yard, without danger to the ship or persons on board.

(e) In every case, the Administration shall fully guarantee the completeness and efficiency of the inspection and survey, and shall undertake to ensure the necessary arrangements to satisfy this obligation.

Regulation 7

Surveys of Passenger Ships

The existing text of paragraph (b)(iii) is replaced by the following:

(iii) A survey either general or partial, according to the circumstances, shall be made after a repair resulting from investigations prescribed in Regulation 11 of this Chapter, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory, and that the ship complies in all respects with the provisions of the Convention and the present Protocol and of the International Regulations for Preventing Collisions at Sea in force, and of the laws, decrees, orders and regulations promulgated as a result thereof by the Administration.

Regulation 8

Surveys of Life-Saving Appliances and other Equipment of Cargo Ships

The existing text of Regulation 8 is replaced by the following:

(a) The life-saving appliances, except a radiotelegraph installation in a motor lifeboat or a portable radio apparatus for survival craft, the echo-sounding device, the gyro-compass, the fire-extinguishing appliances and the inert gas system of cargo ships to which Chapters II-1, II-2, III and V of the Convention and the present Protocol apply, shall be subject to initial and subsequent surveys as prescribed for passenger ships in Regulation 7 of Chapter I of the Convention and the present Protocol with the substitution of 24 months for 12 months in sub-paragraph (a)(ii) of that Regulation. The fire control plans in new ships and the pilot ladders, mechanical

pilot hoists, lights, shapes and means of making sound signals carried by new and existing ships shall be included in the surveys for the purpose of ensuring that they comply fully with the requirements of the Convention and the present Protocol and, where applicable, the International Regulations for Preventing Collisions at Sea in force.

(b) Intermediate surveys shall be made for tankers of ten years of age and over, within three months before or after the anniversary date of the Cargo Ship Safety Equipment Certificate, to ensure that equipment specified in paragraph (a) of this Regulation has been maintained in accordance with Regulation 11 of this Chapter and that it is in good working condition. Such intermediate surveys shall be endorsed on the Cargo Ship Safety Equipment Certificate issued in accordance with Regulation 12(a)(iii) of Chapter I of the Convention.

Regulation 10

Surveys of Hull, Machinery and Equipment of Cargo Ships

The existing text of Regulation 10 is replaced by the following:

(a) The hull, machinery and equipment (other than items in respect of which Cargo Ship Safety Equipment Certificates, Cargo Ship Safety Radiotelegraphy Certificates or Cargo Ship Radiotelephony Certificates are issued) of a cargo ship shall be surveyed on completion and thereafter in such a manner as the Administration may consider necessary in order to ensure that their condition is in all respects satisfactory and at the following intervals:

(i) at intervals specified by the Administration but not exceeding five years (periodical surveys);

(ii) in addition to such periodical surveys a tanker of ten years of age and over shall undergo a minimum of one intermediate survey during the period of validity of its Cargo Ship Safety Construction Certificate. In cases where only one such intermediate survey is carried out in any one certificate validity period, it shall be held not before six months prior to, nor later than six months after, the half-way date of the certificate's period of validity.

(b) The initial and periodical survey shall be such as to ensure that the arrangements, material and scantlings of the structure, boilers and other pressure vessels, their appurtenances, main and auxiliary machinery including steering gear and associated control systems, electrical installation and other equipment are in all respects satisfactory for the service for which the ship is intended. Such surveys shall, in the case of tankers, also include inspection of the outside of the ship's bottom, pump rooms, cargo and bunker piping systems, vent piping, pressure vacuum valves and flame screens.

(c) The intermediate survey of tankers of ten years of age and over shall include inspection of steering gear equipment and associated control systems, pump rooms, cargo and bunker piping systems on deck and in pump rooms, vent piping, pressure vacuum valves and flame screens, the electrical installations in dangerous zones, and the outside of the ship's bottom. In addition to the visual inspection of the electrical installation, the insulation resistance of the electrical equipment in dangerous zones is to be tested. If, upon examination, there should be any doubt as to the condition of the piping, extra measures, such as pressure tests and thickness determination, shall be taken as necessary. Such intermediate surveys shall be endorsed on the Cargo Ship Safety Construction Certificate issued in accordance with Regulation 12(a)(ii) of Chapter I of the Convention.

(d) A survey, either general or partial according to the circumstances, shall be made when required after an investigation prescribed in Regulation 11 of this Chapter, or whenever any important repairs or renewals are made. The survey shall be such as to ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are in all respects satisfactory, and that the ship is fit to proceed to sea without danger to the ship or persons on board.

Regulation 11

Maintenance of Conditions after Survey

The existing text of Regulation 11 is replaced by the following:

(a) The condition of the ship and its equipment shall be maintained to conform with the provisions of the Convention and the present Protocol to ensure that the ship in all respects will remain fit to proceed to sea without danger to the ship or persons on board.

(b) After any survey of the ship under Regulations 6, 7, 8, 9 or 10 of Chapter I of the Convention and the present Protocol has been completed, no change shall be made in the structural arrangement, machinery, equipment and other items covered by the survey, without the sanction of the Administration.

(c) Whenever an accident occurs to a ship or a defect is discovered, either of which affects the safety of the ship or the efficiency or completeness of its life-saving appliances or other equipment, the master or owner of the ship shall report at the earliest opportunity to the Administration, the nominated surveyor or recognized organization responsible for issuing the relevant certificate, who shall cause investigations to be initiated to determine whether a survey, as required by Regulations 6, 7, 8, 9 or 10 of Chapter I of the Convention and the present Protocol, is necessary. If the ship is in a port of another Party, the master or owner shall also report immediately to the appropriate authorities of the Port State and the nominated surveyor or recognized organization shall ascertain that such a report has been made.

Regulation 14

Duration and Validity of Certificates

The existing text of Regulation 14 is replaced by the following:

(a) Certificates other than the Cargo Ship Safety Construction Certificate, the Cargo Ship Safety Equipment Certificate and any Exemption Certificate shall be issued for a period not exceeding 12 months. The Cargo Ship Safety Construction Certificate shall be issued for a period not exceeding five years. The Cargo Ship Safety

Equipment Certificate shall be issued for a period not exceeding 24 months. Exemption Certificates shall not be valid for longer than the period of the certificates to which they refer.

(b) No extension of the five-year period of validity of the Cargo Ship Safety Construction Certificate shall be permitted.

(c) If a survey takes place within two months before the end of the period for which a Cargo Ship Safety Radiotelegraphy Certificate or a Cargo Ship Safety Radiotelephony Certificate issued in respect of cargo ships of 300 tons gross tonnage and upwards, but less than 500 tons gross tonnage, was originally issued, that certificate may be withdrawn, and a new certificate may be issued which shall expire 12 months after the end of the said period.

(d) If the ship at the time when a certificate, other than that referred to in paragraph (b) of this Regulation, expires is not in a port of the country in which it is registered or is to be surveyed, the Administration may extend the certificate, but such extension shall be granted only for the purpose of allowing the ship to complete its voyage to the country in which it is registered or is to be surveyed, and then only in cases where it appears proper and reasonable to do so.

(e) No certificate shall be extended under the provisions of paragraph (d) of this Regulation for a longer period than five months, and a ship to which an extension is granted shall not, on its arrival in the country in which it is registered or the port in which it is to be surveyed, be entitled by virtue of such extension to leave that port or country without having obtained a new certificate.

(f) A certificate, other than that referred to in paragraph (b) of this Regulation, which has not been extended under the foregoing provisions of this Regulation, may be extended by the Administration for a period of grace up to one month from the date of expiry stated on it.

(g) A certificate shall cease to be valid:

(i) if the inspections and surveys are not carried out within the periods specified under Regulations 7(a), 8, 9 and 10(a) of Chapter I of the Convention and the present Protocol or

as they may have been extended in accordance with paragraphs (d), (e) or (f) of this Regulation, or

(ii) upon transfer of the ship to the flag of another Government. A new certificate shall only be issued when the Government issuing the new certificate is fully satisfied that the ship is in compliance with the requirements of Regulation 11(a) and (b) of this Chapter. In the case of a transfer between Parties, if requested within three months after the transfer has taken place, the Government of the Party whose flag the ship was formerly entitled to fly shall, as soon as possible, transmit to the Administration copies of the certificates carried by the ship before the transfer and, if available, copies of the relevant survey reports.

Regulation 19

Control

The existing text of Regulation 19 is replaced by the following:

(a) Every ship when in a port of another Party is subject to control by officers duly authorized by such Government in so far as this control is directed towards verifying that the certificates issued under Regulation 12 or Regulation 13 of Chapter I of the Convention are valid.

(b) Such certificates, if valid, shall be accepted unless there are clear grounds for believing that the condition of the ship or of its equipment does not correspond substantially with the particulars of any of the certificates or that the ship and its equipment are not in compliance with the provisions of Regulation 11(a) and (b) of this Chapter.

(c) In the circumstances given in paragraph (b) of this Regulation or where a certificate has expired or ceased to be valid, the officer carrying out the control shall take steps to ensure that the ship shall not sail until it can proceed to sea or leave the port for the purpose of proceeding to the appropriate repair yard without danger to the ship or persons on board.

(d) In the event of this control giving rise to an intervention of any kind, the officer carrying out the control shall forthwith inform, in writing, the Consul or, in his absence, the nearest diplomatic representative of the State whose flag the ship is entitled to fly of all the circumstances in which intervention was deemed necessary. In addition, nominated surveyors or recognized organizations responsible for the issue of the certificates shall also be notified. The facts concerning the intervention shall be reported to the Organization.

(e) The Port State authority concerned shall notify all relevant information about the ship to the authorities of the next port of call, in addition to parties mentioned in paragraph (d) of this Regulation, if it is unable to take action as specified in paragraphs (c) and (d) of this Regulation or if the ship has been allowed to proceed to the next port of call.

(f) When exercising control under this Regulation all possible efforts shall be made to avoid a ship being unduly detained or delayed. If a ship is thereby unduly detained or delayed it shall be entitled to compensation for any loss or damage suffered.

CHAPTER II-1

CONSTRUCTION - SUBDIVISION AND STABILITY, MACHINERY AND ELECTRICAL INSTALLATIONS

PART A - GENERAL

Regulation 1

Application

The following sub-paragraphs are added to the existing text of paragraph (b):

(iii) Notwithstanding the provisions of sub-paragraph (ii) of this paragraph and sub-paragraph (a)(iii) of this Regulation, for the purposes of paragraph (d) of Regulation 29 of this Chapter, a new tanker means a tanker:

(1) for which the building contract is placed after 1 June 1979; or

(2) in the absence of a building contract, the keel of which is laid, or which is at a similar stage of construction after 1 January 1980; or

(3) the delivery of which is after 1 June 1982; or

(4) which has undergone an alteration or modification of a major character:

(a) for which the contract is placed after 1 June 1979; or

(b) in the absence of a contract, the construction work of which is begun after 1 January 1980; or

(c) which is completed after 1 June 1982.

(iv) For the purposes of paragraph (d) of Regulation 29 of this Chapter, an existing tanker is a tanker which is not a new tanker as defined in sub-paragraph (iii) of this paragraph.

(v) For the purposes of sub-paragraph (iii) of this paragraph, conversion of an existing tanker of 20,000 metric tons deadweight and upwards to meet the requirements of the present Protocol or

the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, shall not be deemed to constitute an alteration or modification of a major character.

Regulation 2

Definitions

The following paragraphs are added to the existing text:

(k) The remote steering gear control system is the means by which required rudder movements are transmitted from the navigating bridge to the steering gear power unit controls.

(l) The main steering gear is the machinery, the steering gear power units, if any, and ancillary equipment and the means of applying torque to the rudder stock (e.g. tiller or quadrant) necessary for effecting movement of the rudder for the purpose of steering the ship under normal service conditions.

(m) The steering gear power unit is:

(i) in the case of electric steering gear, an electric motor and its associated electrical equipment;

(ii) in the case of electro-hydraulic steering gear, an electric motor and its associated electrical equipment and connected pump;

(iii) in the case of other hydraulic steering gear, a driving engine and connected pump.

(n) The auxiliary steering gear is that equipment which is provided for effecting movement of the rudder for the purpose of steering the ship in the event of failure of the main steering gear.

PART C - MACHINERY AND ELECTRICAL INSTALLATIONS

Regulation 29

Steering Gear

The following paragraph is added to the existing text:

(d) Tankers only

(i) The following shall apply to every new tanker of 10,000 tons gross tonnage and upwards and, not later than two years from the date of entry into force of the present Protocol, to every existing tanker of 10,000 tons gross tonnage and upwards:

(1) two remote steering gear control systems shall be provided, each of which shall be operable separately from the navigating bridge. This does not require duplication of the steering wheel or steering lever. In the event of failure of the remote steering gear control system in operation, the other system shall be capable of being brought into immediate operation from a position on the navigating bridge. Each remote steering gear control system, if electric, shall be served by its own separate circuit supplied from the steering gear power circuit from a point within the steering gear compartment. In the event of failure of electrical power supply to a remote steering gear control system an alarm shall be given on the navigating bridge. The alarms required in this sub-paragraph shall be both audible and visual and situated in a position on the navigating bridge where they can be readily observed;

(2) control of the main steering gear shall also be provided in the steering gear compartment;

(3) means shall be provided in the steering gear compartment to disconnect the remote steering gear control system from the power circuit;

(4) a means of communication shall be provided between the navigating bridge and the steering gear compartment;

(5) the exact angular position of the rudder shall be indicated on the navigating bridge. The rudder angle indication shall be independent of the remote steering gear control system; and

(6) the angular position of the rudder shall be recognizable in the steering gear compartment.

(ii) In every new tanker of 10,000 tons gross tonnage and upwards, in addition to the requirements of paragraph (a) and sub-paragraph (d)(i) of this Regulation, the following shall apply:

(1) the main steering gear shall comprise two or more identical power units and it shall be capable of operating the rudder as required by sub-paragraph (d)(ii)(2) of this Regulation while operating with one or more power units. As far as reasonable and practicable, the main steering gear shall be so arranged that a single failure in its piping or in one of the power units will not impair the integrity of the remaining part of the steering gear. All mechanical couplings which are part of the steering gear and the mechanical connexion with any remote steering gear control system, if any, shall be of sound and reliable construction to the satisfaction of the Administration;

(2) the main steering gear shall, with the ship at its deepest sea-going draught, be capable of putting the rudder over from 35 degrees on one side to 35 degrees on the other side with the ship running ahead at maximum service speed. The rudder shall be capable of being put over from 35 degrees on either side to 30 degrees on the other side in not more than 28 seconds, under the same conditions;

(3) the main steering gear shall be operated by power where necessary to fulfil the requirements of sub-paragraph (d)(ii)(2) of this Regulation;

(4) the main steering gear power units shall be arranged to start automatically when power is restored after a power failure;

(5) in the event of failure of any of the steering gear power units an alarm shall be given on the navigating bridge. Every steering gear power unit shall be capable of being brought into operation either automatically or manually from a position on the navigating bridge; and

(6) an alternative power supply, at least sufficient to supply a steering gear power unit so as to enable it to move the rudder as specified below, and also to supply its associated remote steering gear control system and the rudder angle indicator, shall be provided, automatically, within 45 seconds, either from the emergency source of electrical power, or from another independent source of power located in the steering gear compartment. This independent source of power shall be used only for this purpose and shall have a capacity sufficient for half an hour of continuous operation. The steering gear power unit, when being supplied by the alternative power supply, shall at least be capable of putting the rudder over from 15 degrees on one side to 15 degrees on the other side in not more than 60 seconds with the ship at its deepest sea-going draught while running at one half of its maximum service speed ahead or 7 knots, whichever is the greater.

CHAPTER II-2

CONSTRUCTION - FIRE PROTECTION, FIRE DETECTION AND FIRE EXTINCTION

PART A - GENERAL

Regulation 1

Application

The following sub-paragraphs are added to the existing text of paragraph (a):

(iv) Notwithstanding the provisions of sub-paragraphs (ii) and (iii) of this paragraph, for the purposes of paragraph (a)(ii) of Regulation 55 and of Regulation 60 of this Chapter, a new tanker means a tanker:

(1) for which the building contract is placed after 1 June 1979; or

(2) in the absence of a building contract, the keel of which is laid, or which is at a similar stage of construction after 1 January 1980; or

(3) the delivery of which is after 1 June 1982; or

(4) which has undergone an alteration or modification of a major character:

(a) for which the contract is placed after 1 June 1979; or

(b) in the absence of a contract, the construction work of which is begun after 1 January 1980; or

(c) which is completed after 1 June 1982.

(v) For the purposes of paragraph (a)(ii) of Regulation 55 and of Regulation 60 of this Chapter, an existing tanker is a tanker which is not a new tanker as defined in sub-paragraph (iv) of this paragraph.

(vi) For the purposes of sub-paragraph (iv) of this paragraph, conversion of an existing tanker of 20,000 metric tons deadweight and upwards to meet the requirements of the present Protocol or the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973 shall not be deemed to constitute an alteration or modification of a major character.

Regulation 3

Definitions

The existing text of paragraph (v) is replaced by the following:

(v) "Lightweight" means the displacement of a ship in metric tons without cargo, fuel, lubricating oil, ballast water, fresh water and feed water in tanks, consumable stores, and passengers and crew and their effects.

The following paragraph is added to the existing text:

(x) "Crude oil" means any oil occurring naturally in the earth whether or not treated to render it suitable for transportation and includes:

(i) crude oil from which certain distillate fractions may have been removed; and

(ii) crude oil to which certain distillate fractions may have been added.

PART E - FIRE SAFETY MEASURES FOR TANKERS

Regulation 55

Application

The existing text of this Regulation is replaced by the following:

(a) Unless expressly provided otherwise:

(i) this Part shall apply to all new tankers carrying crude oil and petroleum products having a flashpoint not exceeding 60°C (140°F) (closed cup test) as determined by an approved flashpoint apparatus and a Reid vapour pressure which is below

atmospheric pressure and other liquid products having a similar fire hazard; and

(ii) in addition, all ships covered by this Part shall comply with the requirements of Regulations 52, 53 and 54 of Chapter II-2 of the Convention except that fixed gas fire-extinguishing systems for cargo spaces shall not be used for new tankers and for those existing tankers complying with Regulation 60 of this Chapter. For existing tankers not required to comply with Regulation 60, the Administration, in applying the requirements of paragraph (f) of Regulation 52, may accept a froth system capable of discharging froth internally or externally to the tanks. The details of the installation shall be to the satisfaction of the Administration.

(b) Where cargoes other than those referred to in sub-paragraph (a)(i) of this Regulation which introduce additional fire hazards are intended to be carried, additional safety measures shall be required to the satisfaction of the Administration.

(c) Combination carriers shall not carry solid cargoes unless all cargo tanks are empty of oil and gas freed or unless, in each case, the Administration is satisfied with the arrangements provided.

Regulation 60

Cargo Tank Protection

The existing text of this Regulation is replaced by the following:

(a) For new tankers of 20,000 metric tons deadweight and upwards, the protection of the cargo tanks deck area and cargo tanks shall be achieved by a fixed deck froth system and a fixed inert gas system in accordance with the requirements of Regulations 61 and 62 of Chapter II-2 of the Convention except that in lieu of the above installations the Administration, after having given consideration to the ship's arrangement and equipment, may accept other combinations of fixed installations if they afford protection equivalent to the above, in accordance with Regulation 5 of Chapter I of the Convention.

(b) To be considered equivalent, the system proposed in lieu of the deck froth system shall:

(i) be capable of extinguishing spill fires and also preclude ignition of spilled oil not yet ignited; and

(ii) be capable of combating fires in ruptured tanks.

(c) To be considered equivalent, the system proposed in lieu of the fixed inert gas system shall:

(i) be capable of preventing dangerous accumulations of explosive mixtures in intact cargo tanks during normal service throughout the ballast voyage and necessary in-tank operations; and

(ii) be so designed as to minimize the risk of ignition from the generation of static electricity by the system itself.

(d) Any existing tanker of 20,000 metric tons deadweight and upwards engaged in the trade of carrying crude oil shall be fitted with an inert gas system, complying with the requirements of paragraph (a) of this Regulation, not later than a date:

(i) for a tanker of 70,000 metric tons deadweight and upwards, two years after the date of entry into force of the present Protocol; and

(ii) for a tanker of less than 70,000 metric tons deadweight, four years after the date of entry into force of the present Protocol, except that for tankers less than 40,000 tons deadweight not fitted with tank washing machines having an individual throughput of greater than 60 cubic metres per hour, the Administration may exempt existing tankers from the requirements of this paragraph, if it would be unreasonable and impracticable to apply these requirements, taking into account the ship's design characteristics.

(e) Any existing tanker of 40,000 metric tons deadweight and upwards engaged in the trade of carrying oil other than crude oil and any such tanker of 20,000 metric tons deadweight and upwards engaged in the trade of carrying oil other than crude oil fitted with tank washing machines having an individual throughput of greater than 60 cubic metres per hour shall be fitted with an inert gas system, complying with the requirements of paragraph (a) of this Regulation, not later than a date:

(i) for a tanker of 70,000 metric tons deadweight and upwards, two years after the date of entry into force of the present Protocol; and

(ii) for a tanker of less than 70,000 metric tons deadweight, four years after the date of entry into force of the present Protocol.

(f) Any tanker operating with a cargo tank cleaning procedure using crude oil washing shall be fitted with an inert gas system complying with the requirements of Regulation 62 of Chapter II-2 of the Convention and with fixed tank washing machines.

(g) All tankers fitted with a fixed inert gas system shall be provided with a closed ullage system.

(h) Any new tanker of 2,000 tons gross tonnage and upwards not covered by paragraph (a) of this Regulation shall be provided with a froth system, capable of discharging froth internally or externally, to the tanks. The details of such installation shall be to the satisfaction of the Administration.

CHAPTER V

SAFETY OF NAVIGATION

Regulation 12

Shipborne Navigational Equipment

The existing text of paragraph (a) is replaced by the following:

(a) All ships of 1,600 tons gross tonnage and upwards but less than 10,000 tons gross tonnage shall be fitted with at least one radar. All ships of 10,000 tons gross tonnage and upwards shall be fitted with at least two radars, each capable of operating independently of the other. All radars fitted in compliance with this Regulation shall be of a type approved by the Administration and shall conform to operational standards not inferior to those adopted by the Organisation. Facilities for plotting radar readings shall be provided on the bridge in those ships.

Regulation 19

Use of the Automatic Pilot

The following paragraph is added to the existing text:

(d) The manual steering shall be tested after prolonged use of the automatic pilot, and before entering areas where navigation demands special caution.

The following new Regulations are added to this Chapter:

Regulation 19-1

Operation of Steering Gear

In areas where navigation demands special caution, ships shall have more than one steering gear power unit in operation when such units are capable of simultaneous operation.

Regulation 19-2

Steering Gear - Testing and Drills

(a) Within 12 hours before departure, the ship's steering gear shall be checked and tested by the ship's crew. The test procedure shall include, where applicable, the operation of the following:

(i) the main steering gear;

(ii) the auxiliary steering gear;

(iii) the remote steering gear control systems;

(iv) the steering positions located on the navigating bridge;

(v) the emergency power supply;

(vi) the rudder angle indicators in relation to the actual position of the rudder;

(vii) the remote steering gear control system power failure alarms; and

(viii) the steering gear power unit failure alarms.

(b) The checks and tests shall include:

(i) the full movement of the rudder according to the required capabilities of the steering gear;

(ii) a visual inspection of the steering gear and its connecting linkage; and

(iii) the operation of the means of communication between the navigating bridge and steering gear compartment.

(c) (i) Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear power units shall be permanently displayed on the navigating bridge and in the steering gear compartment.

(ii) All officers concerned with the operation and/or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship and with the procedures for changing from one system to another.

(d) In addition to the routine checks and tests prescribed in paragraphs (a) and (b) of this Regulation, emergency steering drills shall take place at least once every three months in order to practise emergency steering procedures. These drills shall include direct control from within the steering gear compartment, the communications procedure with the navigating bridge and, where applicable, the operation of alternative power supplies.

(e) The Administration may waive the requirement to carry out the checks and tests prescribed in paragraphs (a) and (b) of this Regulation for ships which regularly ply on voyages of short duration. Such ships shall carry out these checks and tests at least once every week.

(f) The date upon which the checks and tests prescribed in paragraphs (a) and (b) of this Regulation are carried out and the date and details of emergency steering drills carried out under paragraph (d) of this Regulation, shall be recorded in the log book as may be prescribed by the Administration.

APPENDIX

Form of Safety Construction Certificate for Cargo Ships

The following form of Supplement is added to the existing form:

SUPPLEMENT TO THE CARGO SHIP SAFETY CONSTRUCTION CERTIFICATE

(Official Seal) (Country)

Issued under the provisions of the
PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

Name of Ship	Distinctive Number or Letters	Port of Registry	Deadweight of Ship (metric tons)	Year of Build

Type of ship:

Tanker engaged in the trade of carrying crude oil*

Tanker engaged in the trade of carrying oil other than crude oil*

Tanker engaged in the trade of carrying crude/other oil*

Cargo ship other than a tanker engaged in the trade of carrying oil*

Date of contract for building or alteration or modification of a major character .....

Date on which keel was laid or ship was at a similar stage of construction or on which an alteration or modification of a major character was commenced .....

Date of delivery or completion of an alteration or modification of a major character .....

---

* Delete as appropriate.

This Supplement shall be permanently attached to the Cargo Ship Safety Construction Certificate.

THIS IS TO CERTIFY:

That the ship has been surveyed in accordance with Regulation 10 of Chapter I of the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974; and

that the survey showed that the condition of the hull, machinery and equipment as defined in the above Regulation was in all respects satisfactory and that the ship complied with the requirements of that Protocol.

This certificate is valid until ..... subject to intermediate survey(s) at intervals of .....

Issued at .....
(Place of issue of certificate)

..... 19.. .....
(Signature of duly authorized official issuing the certificate)

(Seal or stamp of the issuing Authority, as appropriate)

INTERMEDIATE SURVEY

This is to certify that at an intermediate survey required by Regulation 10 of Chapter I of the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974, this ship was found to comply with the relevant provisions of that Protocol.

Signed.....
(Signature of duly authorized official)

Place.....

Date.....

Next intermediate survey due.....

(Seal or stamp of the Authority, as appropriate)

Signed.....
(Signature of duly authorized official)

Place.....

Date.....

Next intermediate survey due.....

(Seal or stamp of the Authority, as appropriate)

Signed.....
(Signature of duly authorized official)

Place.....

Date.....

Next intermediate survey due.....

(Seal or stamp of the Authority, as appropriate)

Signed.....
(Signature of duly authorized official)

Place.....

Date.....

(Seal or stamp of the Authority, as appropriate)

Form of Safety Equipment Certificate for Cargo Ships

The following form of Supplement is added to the existing form:

SUPPLEMENT TO THE CARGO SHIP SAFETY EQUIPMENT CERTIFICATE

(Official Seal) (Country)

Issued under the provisions of the
PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974

Name of Ship	Distinctive Number or Letters	Port of Registry	Deadweight of Ship (metric tons)	Year of Build

Type of ship:

Tanker engaged in the trade of carrying crude oil*

Tanker engaged in the trade of carrying oil other than crude oil*

Tanker engaged in the trade of carrying crude/other oil*

Cargo ship other than a tanker engaged in the trade of carrying oil*

Date of contract for building or alteration or modification of a major character .....

Date on which keel was laid or ship was at a similar stage of construction or on which an alteration or modification of a major character was commenced .....

Date of delivery or completion of an alteration or modification of a major character .....

---

* Delete as appropriate.

This Supplement shall be permanently attached to the Cargo Ship Safety Equipment Certificate.

THIS IS TO CERTIFY:

That the ship has been surveyed in accordance with Regulation 8 of Chapter I of the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974; and

that the survey showed that the condition of the safety equipment as defined in the above Regulation was in all respects satisfactory and that the ship complied with the requirements of that Protocol.

This certificate is valid until ..... subject to intermediate survey(s) at intervals of .....

Issued at .....
(Place of issue of certificate)

..... 19..

.....
(Signature of duly authorised official issuing the certificate)

(Seal or stamp of the issuing Authority, as appropriate)

INTERMEDIATE SURVEY

This is to certify that at an intermediate survey required by Regulation 8 of Chapter I of the Protocol of 1978 Relating to the International Convention for the Safety of Life at Sea, 1974, the ship was found to comply with the relevant provisions of that Protocol.

Signed .....
(Signature of duly authorized official)

Place .....

Date .....

Next intermediate survey due .....

(Seal or stamp of the Authority, as appropriate)

Signed .....
(Signature of duly authorized official)

Place .....

Date .....

(Seal or stamp of the Authority, as appropriate)

Under the provisions of Regulation 14 of Chapter I of the Protocol the validity of this Certificate is extended until

.....

Signed .....
(Signature of duly authorized official)

Place .....

Date .....

(Seal or stamp of the Authority, as appropriate)

Certified true copy of the Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974 done at London on 17 February 1978, the original of which is deposited with the Secretary-General of the Inter-Governmental Maritime Consultative Organization.

For the Secretary-General of the Inter-Governmental Maritime Consultative Organization:

Thomas D. Fuscher

London, 2. VI. 78

[4910-14]

[CGD 78-082A]

TANKER SAFETY AND POLLUTION PREVENTION

Revision to Regulatory Implementation Plan Schedule

PURPOSE

The purpose of this notice is to inform the public of a revision to the schedule of the Coast Guard plan for regulatory implementation of the results of the International Conference on Tanker Safety and Pollution Prevention (TSPP) sponsored by the Intergovernmental Maritime Consultative Organization (IMCO) from February 6 through 17, 1978.

DISCUSSION

In the April 20, 1978 FEDERAL REGISTER, Volume 43, No. 77, pages 16886 through 16890, the Coast Guard issued a notice to inform the public of the results of the International Conference on Tanker Safety and Pollution Prevention and to provide the public with the anticipated plan for regulatory implementation of the results of the conference. At the TSPP Conference new measures and procedures to improve the safety of oil tankers and reduce pollution of the sea from ships were developed which expanded the requirements of the 1974 Safety of Life at Sea Convention (SOLAS 74) and the 1973 Marine Pollution Convention (MARPOL 73). It is the intention of the Coast Guard to implement these new measures and procedures into Federal regulations. Table 2 on page 16890 of the April 20 FEDERAL REGISTER set forth the expected schedule necessary to develop and finalize these Federal regulations and the effective implementation dates once the regulations become final.

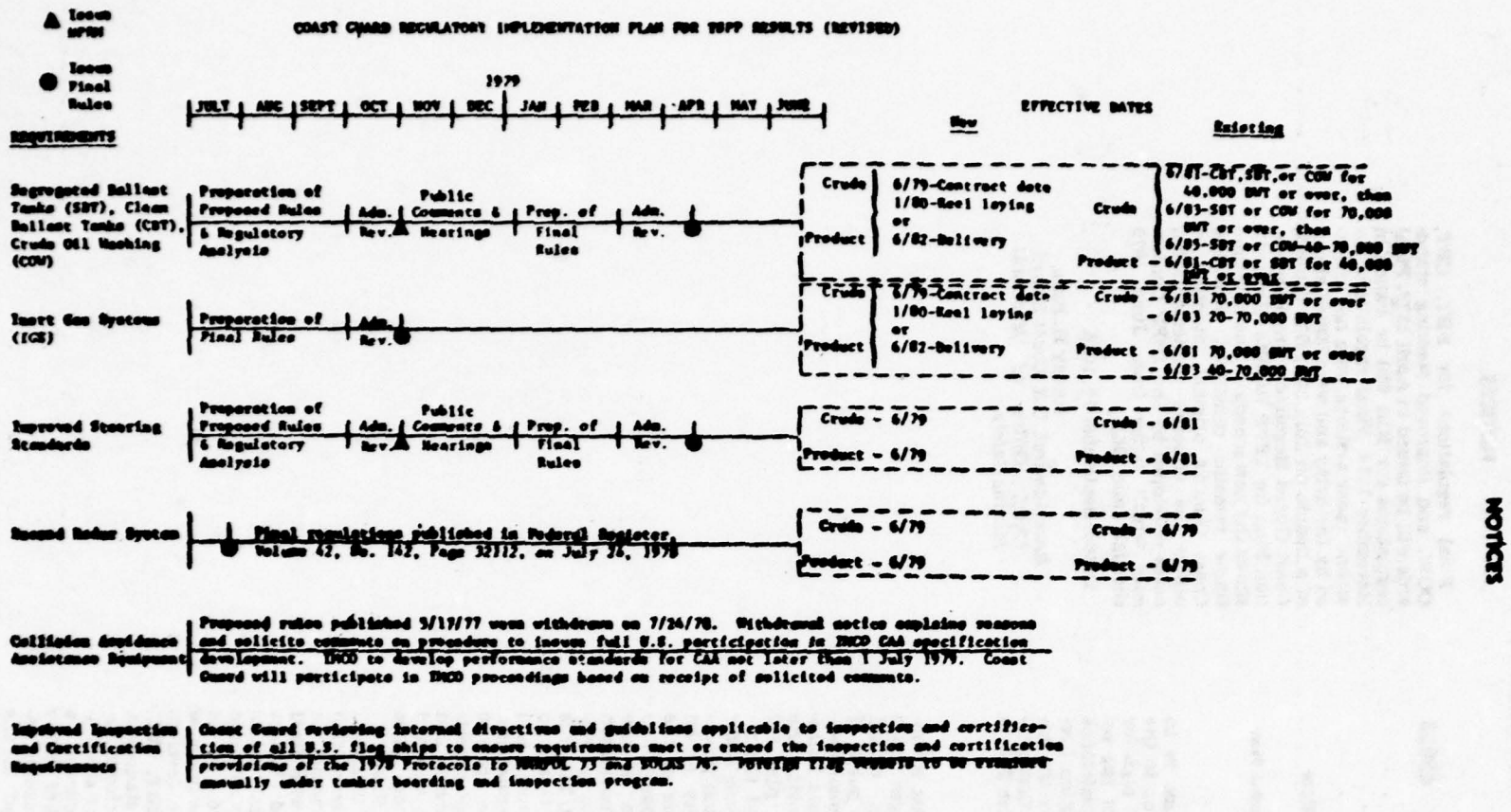
It was originally estimated that final regulations for inert gas systems (IGS) and second radar systems would be issued during August 1978, with final regulations for segregated ballast tanks (SBT), clean ballast tanks (CBT), crude oil washing (COW), and improved steering standards to be issued in February 1979. The preparatory work necessary for the development and issuance of the SBT, CBT, COW, improved steering standards, and IGS regulations was delayed because project personnel were simultaneously tasked with conducting a study to determine if tanker safety and pollution prevention measures, additional to those developed at the TSPP Conference, should be applied to U.S. tank vessels in domestic trade. As a result of this, the schedule for these final regulations has been revised.

Final regulations for SBT, CBT, COW, and improved steering standards will be issued in April 1979. Final regulations for IGS will be issued in November 1978. Final regulations for second radar systems were not affected by the delay and were issued ahead of schedule on July 24, 1978. Table 2, Coast Guard Regulatory Implementation Plan for TSPP Results (Revised), shows the new schedule. The new time frame remains consistent with the Coast Guard's original intention to utilize the effective implementation dates developed by the TSPP Conference which range from June 1979 through June 1985.

Dated: September 15, 1978.

HENRY H. BELL,
Rear Admiral, U.S. Coast Guard,
Chief, Office of Merchant Marine Safety.

Table 2



[FR Doc. 78-26648 Filed 9-20-78; 8:45 am]

APPENDIX 10

DEPARTMENT OF TRANSPORTATION

COAST GUARD

DRAFT ENVIRONMENTAL IMPACT STATEMENT

INTERNATIONAL CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION

FEBRUARY 1978

DEPARTMENT OF TRANSPORTATION
U. S. COAST GUARD
DRAFT ENVIRONMENTAL IMPACT STATEMENT
PURSUANT TO SECTION 102 (2)(C), P. L. 91-190

SUMMARY

(X) Draft ( ) Final Environmental Statement

Contact individual: Executive Secretary
Marine Safety Council
U. S. Coast Guard (G-CMC/81)
Washington, D. C. 20590
(202) 426-1477

1. Type of Action. (X) Administrative Action. ( ) Legislative Action.

2. Description of the Action

This impact statement covers U. S. participation in the International Conference on Tanker Safety and Pollution Prevention, February 1978, in London, England, and possible U. S. implementation of the standards adopted by this Conference. The objective of U. S. participation in this Conference is to obtain international action to improve tanker safety and pollution prevention standards. The changes are being sought to reduce oil pollution from tanker accidents and routine operational discharges, and to reduce the risk of tanker accidents and resulting loss of life and property damage.

The Conference will consider proposals made by the United States for modifications to the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73), and the International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), along with alternative proposals developed during preparatory meetings of the Intergovernmental Maritime Consultative Organization. These proposals include changes to the current ship construction and equipment standards and international system for inspection and certification of tankers. Changes to ship construction and equipment standards under consideration include: double bottoms on new tankers, or protective location of segregated ballast tanks as an alternative to double bottoms; segregated ballast tanks on new and existing tankers and various alternative or interim measures, including clean ballast tanks and crude oil washing; inert gas systems; a requirement for a second radar and collision avoidance assistance equipment; and improved emergency steering standards.

3. Environmental impacts and adverse environmental effects of the action.

A large number of potential impacts of the various measures being considered on worldwide oil inputs, oil inputs to U. S. waters, and safety are identified and described in Section 3 of the statement. The various protocol alternatives appear to offer potential for a 15-30% reduction in worldwide oil inputs in the near-term over full implementation of MARPOL 73. This reduction is due

mainly to the retrofit of segregated ballast tanks or crude oil washing systems to existing tankers contemplated in the various proposals under consideration. Proposals for double bottoms on new ships or protective location of segregated ballast on new ships appear to offer potential for perhaps a 50% reduction in accidental oil inputs to waters within 50 miles of the U. S. coastline once new ships with these features come into service.

All of the measures being considered by the Conference are aimed at reducing oil inputs to the marine environment. No adverse environmental effects have been identified.

4. List of alternatives considered.

The only alternative to participating in the Conference is not participating in the Conference and this has been rejected as being inconsistent with the U. S. objective of improving international standards for tanker safety and pollution prevention.

Once the Conference is completed and specifics of the proposed changes to the present international requirements are known, an assessment of the potential impacts of these changes can be made and a decision reached on whether the U. S. should adopt these changes and ratify the Protocols developed at the Conference, or proceed on some other course of action.

5. Comments on the draft statement were requested from the agencies and groups listed below:

Department of State
Department of Treasury
Department of Defense
Department of the Interior
Department of Commerce
Department of Transportation
Department of Energy
Environmental Protection Agency
Federal Maritime Commision
Sierra Club
Connecticut Citizens Action Group
Center for Law and Social Policy
American Petroleum Institute
American Institute of Merchant Shipping
American Association of Port Authorities
American Maritime Association
American Waterways Operators, Inc.
Shipbuilders Council of America
Environmental Policy Center
Coalition Against Oil Pollution
National Audubon Society

6. Dates statements were made available to the Council on Environmental Quality and the public:

Draft statement	February 3, 1978
Final Statement	

CONTENTS

	PAGE
SUMMARY	i
1. INTRODUCTION	5
1.1 BACKGROUND	5
1.2 RECOMMENDED MEASURES	7
1.3 ACTIONS TO CARRY OUT THE PRESIDENTIAL INITIATIVES	8
1.3.1 Domestic	8
1.3.2 International	9
1.4 PREPARATION FOR THE INTERNATIONAL CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION	9
1.5 THE PRESENT INTERNATIONAL AGREEMENTS	11
1.6 ISSUES BEFORE THE FEBRUARY CONFERENCE	13
1.7 RELATIONSHIP OF THIS ACTION TO PREVIOUS U.S. ACTIONS	15
1.8 RELATIONSHIP OF THIS ENVIRONMENTAL IMPACT STATEMENT TO PREVIOUS STATEMENTS AND STUDIES	16
FOOTNOTES	16
2. DESCRIPTION AND PURPOSE OF THE ACTION	17
2.1 PURPOSE OF THE ACTION	17
2.2 DESCRIPTION OF THE PROPOSED ACTION	17
2.2.1 Ship Construction and Equipment Standards	17
2.2.1.1 Double bottoms or protective location of segregated ballast tanks as an alternative to double bottoms (new ships)	17
2.2.1.2 Segregated ballast tanks and alternative or interim measures	20
2.2.1.2.1 Segregated Ballast	20
2.2.1.2.2 Clean Ballast	20
2.2.1.2.3 Crude Oil Washing	21
2.2.1.3 Inert gas systems	25
2.2.1.4 "Package" proposals	26
2.2.1.5 Radar and collision avoidance aids	26
2.2.1.6 Improved emergency steering standards	30
2.2.2 Inspection and Certification	31
2.2.3 Other issues to be covered at the Conference	32
2.2.3.1 Acceleration of entry into force of the 1974 SOLAS Convention and the 1973 MARPOL Convention	32
2.2.3.2 Marine Safety Corps	33
2.2.3.3 Control of discharges under the 1969 Admendments to the 1954 Oil Pollution Convention	34

PAGE

3. PROBABLE IMPACT OF THE PROPOSED ACTION ON THE MARINE ENVIRONMENT 36

3.1 QUESTIONS TO BE ANSWERED 36
3.2 PROCEDURES FOR ASSESSING IMPACTS ON THE MARINE ENVIRONMENT 37
3.3 IMPACT OF PROTOCOL ALTERNATIVES ON OIL INPUTS 43
3.3.1 Impact on Worldwide Oil Inputs 43
3.3.2 Impact on Oil Inputs to U.S. Waters (50 miles) 54
3.3.3 Air Pollution 55
3.4 IMPACT OF PROTOCOL ALTERNATIVES ON SAFETY 56
3.5 COST AND ECONOMIC IMPACTS 56
3.6 TECHNICAL FEASIBILITY 61

4. ALTERNATIVES TO THE PROPOSED ACTION 63

5. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED 64

6. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY 65

7. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES 66

REFERENCES 67

APPENDIX A PRESIDENTIAL INITIATIVES OF 17 MARCH 1977, RELATED FACT SHEET AND PRESS RELEASE 70

TABLES

		Page
Table 1	REVISED SCHEDULE OF IMCO MEETINGS HELD DURING 1977 TO PREPARE FOR FEBRUARY 1978 TANKER SAFETY AND POLLUTION PREVENTION CONFERENCE	10
Table 2	TANKER SAFETY AND POLLUTION PREVENTION MEASURES	14
Table 3	UNITED STATES PROPOSAL	27
Table 4	PACKAGE 1	28
Table 5	PACKAGE 2	29
Table 6	IMPACT OF VARIOUS MEASURES ON CRITERIA	44
Table 7	IMPACT OF VARIOUS MEASURES ON WORLDWIDE OIL INPUTS, NEAR TERM	52
Table 8	WORLD TANKER FLEET COSTS	59
Table 9	U.S. TANKER FLEET COSTS	59
Table 10	FOREIGN TANKERS IN U.S. TRADE	60
Table 11	U.S. AND FOREIGN TANKERS IN U.S. OIL TRADE	60

FIGURES

		PAGE
Figure 1	TANK VESSEL OPERATIONAL OIL OUTFLOW SEQUENCES	39
Figure 2	TANK VESSEL ACCIDENTAL OIL OUTFLOW SEQUENCES	40
Figure 3	RELATIONSHIP OF ACCIDENT EVENTS	41
Figure 4	PROCEDURE USED FOR ASSESSING IMPACT OF PROPOSALS ON OIL INPUTS AND SAFETY	42
Figure 5	WORLD OIL OUTFLOW MODEL RESULTS	53

1. INTRODUCTION

1.1 BACKGROUND

This statement is a Draft Environmental Impact Statement issued under the requirements of the National Environmental Policy Act of 1969, Section 102(2)(C), and implementing Guidelines issued by the Council on Environmental Quality. The "major Federal action affecting the quality of the human environment" whose impact is being assessed is possible U.S. implementation of standards adopted by the Conference on Tanker Safety and Pollution Prevention, London, England, February 1978. Participation at the Conference is the first phase of implementation of the standards, and this draft assesses U.S. participation at the Conference.

This Conference is being sponsored by the Intergovernmental Maritime Consultative Organization (IMCO), the specialized agency of the United Nations concerned solely with maritime affairs. The conference will consider proposals made by the United States for modifications to the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73), and the International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), along with alternative proposals developed during preparatory meetings sponsored by IMCO.

The objective of the proposed modifications to MARPOL 73 and SOLAS 74 is to improve tanker safety and pollution prevention.

During the Winter of 1976/1977 several tanker casualties occurred in or near U.S. waters which demonstrated a need for a global effort to improve both the levels of safety and degree of pollution protection from oil tankers.

On the evening of 17 December 1976 in Los Angeles Harbor, the explosion of the SS SANSINENA resulted in six deaths plus three missing and presumed dead, injuries to 58 persons, release of approximately 64 tons of bunker oil into the harbor, and loss of a vessel valued at twenty one point six (21.6) million dollars.

This casualty was one of a number of tragic incidents that began two days earlier (15 Dec) with the grounding of the ARGO MERCHANT twenty eight (28) miles southeast of Nantucket Island resulting in the spill of 23 thousand tons of #6 fuel oil and the loss of the vessel. These two casualties were quickly followed by a pollution incident involving the tank

vessel OSWEGO PEACE wherein, 16 tons of bunker oil leaked through a rupture in the skin of a tank into the Thames River in New London, Conn. on 24 December; the grounding of the SS OLYMPIC GAMES in the Delaware River on 27 December resulting in the spill of 424 tons of crude oil with no loss of life; the grounding of the fully loaded ore/oil carrier, SS DAPHNE while approaching a harbor in Puerto Rico on 28 December; the explosion and fire on board the ore/oil carrier SS MARY ANN on 1 January in the Atlantic Ocean resulting in injuries to two crewmembers; the disappearance of the fully loaded (26 thousand tons of #6 oil) tank vessel GRAND ZENITH in the North Atlantic Ocean enroute Providence, R.I. around 2 January 1977; the grounding on 4 January 1977 of the tankship UNIVERSE LEADER in the Delaware River with no loss of cargo; the loss of the coastwise U.S. tanker CHESTER A. POLING on 10 January due to structural failure in the Atlantic Ocean with the loss of one life; the loss of the tanker IRENES CHALLENGER in the North Pacific Ocean on 17 January with three crewmembers missing; the explosion of the EXXON SAN FRANCISCO while in a U.S. port on 27 January with the loss of three lives; the striking of the Hopewell Bridge in Virginia on 24 February 1977 by the U.S. Flag chemical carrier SS MARINE FLORIDIAN as a result of a steering gear malfunction; and the explosion of the CLAUDE CONWAY in the Atlantic Ocean on 27 March 1977 resulting in the loss of twelve lives and the vessel itself.

This series of accidents resulted in great public concern within the United States over the risks associated with the marine transportation of oil. Demands for the government to take additional steps to improve tanker safety and pollution prevention were evident.

Both the Executive Branch of the Federal government and the Congress responded to these demands. An Interagency Oil Pollution Task Force was established to review the problem and make recommendations.[1] As a result, on March 17, 1977, President Carter announced a series of desired Federal government actions[2] to deal with the problem of marine oil pollution caused by oil tankers.

The Presidential Initiatives[3] announced on March 17, 1977 included a diverse but interrelated group of measures designed to reduce the risks associated with the maritime transportation of oil. These measures are both international and domestic in nature and scope and are aimed at achieving the following objectives:

- Reduce oil pollution caused by tanker accidents and by routine operational discharges from all vessels;

- Improve our ability to deal swiftly and effectively with oil spills;

- Provide full and dependable compensation to victims of oil pollution damage;

- Reduce risk of tanker accidents and resulting loss of life and property damage.

1.2 RECOMMENDED MEASURES

The measures recommended by President Carter include:

- Ratification of the International Convention for the Prevention of Pollution from Ships (MARPOL 73)

- Reform of ship construction and equipment standards, to include for all oil tankers over 20,000 DWT

  - Double bottoms on all new tankers;

  - Segregated ballast on all tankers;

  - Inert gas systems on all tankers;

  - Backup radar and collision avoidance equipment on all tankers;

  - Improved emergency steering standards for all tankers;

  - Where technological improvements and alternatives can be shown to achieve the same degree of protection against pollution or safety benefits, the proposed rules will allow their use.

- Improvement of international system of inspection and certification of tankers

- Improvement of crew standards and training, including any necessary changes to licensing and qualification standards for American crews, and upgrading of international requirements

- Development of an expanded tanker boarding program and marine safety information system

• Approval of comprehensive oil pollution liability and compensation legislation

• Improvement of Federal ability to respond to oil pollution emergencies

1.3 ACTIONS TO CARRY OUT THE PRESIDENTIAL INITIATIVES

In carrying out the program announced by the President, the following actions have taken place in the Domestic and International arenas:

1.3.1 Domestic

• The 1973 Marine Pollution Convention has been submitted to the Senate for ratification and implementing legislation has been submitted to both houses of Congress;

• Proposed regulations incorporating the recommended changes to ship construction and equipment standards have been published;

• The Coast Guard is intensifying its efforts to improve qualification and training of U.S. crews through development of new requirements for tankermen, new licensing requirements for pilots, improved requirements for radar observer endorsement, and examination of a possible requirement for shiphandling simulator training for masters and chief mates on large vessels;

• The Tanker Boarding Program has been expanded so that each foreign tanker calling at U.S. ports is boarded and examined annually for compliance with all safety and pollution standards presently applicable to foreign flag tankers under both domestic regulations and international agreements. A Marine Safety Information System has been developed to maintain records of vessel casualties, pollution incidents, violations of safety and pollution prevention regulations, and names of vessel owners.

• Legislation providing comprehensive oil pollution liability and compensation has been submitted, approved by the House and is awaiting action by the Senate;

• A number of studies are in progress to determine how Federal ability to respond to oil pollution emergencies can be improved.

1.3.2 International

- The United States has proposed changes to the present international standards for tanker construction and equipment and the international system of inspection and certification of tankers, and these proposals will be considered with various alternatives proposed by other nations at the International Conference on Tanker Safety and Pollution Prevention, 6-17 February 1978;

- The United States has requested and IMCO has agreed to reschedule the International Conference on Training and Certification of Seafarers for 14 June-7 July 1978 from its planned date in the fall of 1978.

1.4 PREPARATION FOR THE INTERNATIONAL CONFERENCE ON TANKER SAFETY AND POLLUTION PREVENTION

The United States proposed international action to improve tanker safety and pollution prevention in accordance with the recommendations in the Presidential Initiatives at the thirty-sixth session of the Maritime Safety Committee of IMCO in April 1977. In response to the U.S.'s request, the MSC agreed on the following rearrangement of the work program, subject to approval by the IMCO Council:

(a) to convene an International Conference on Tanker Safety and Pollution Prevention from 6 to 17 February 1978;

(b) to bring forward the date of the Conference on Training and Certification of Seafarers to 14 June-7 July 1978;

(c) to set up an Intersessional Working Group on Tanker Safety and Pollution Prevention (TSPP), open to all IMCO members and organizations in consultative status, to consider in detail the United States proposals as well as any other alternative or additional proposals;

(d) to hold a joint Maritime Safety Committee/Marine Environmental Protection Committee (MSC/MEPC) meeting from 10 to 21 October 1977 to formulate proposals and documentation for the Conference.

This altered work schedule was approved by the IMCO Council in May 1977 and, as a result, the meetings shown in Table 1 were conducted in preparation for the February Conference.

Table 1

REVISED SCHEDULE OF IMCO MEETINGS HELD DURING 1977 TO PREPARE FOR FEBRUARY 1978 TANKER SAFETY AND POLLUTION PREVENTION CONFERENCE

April 1977.	.U.S. proposed international action; MSC agreed to rearrange work program and schedule conference for Feb 1978.
May 1977	Secretary Adams presented statement to IMCO Council; approved work program and conference scheduled.
	Intersessional Working Group on tanker safety and pollution prevention (TSPP), 1st session
June 1977	.MEPC, 7th session, concurred with action by MSC and Council
	TSPP, 2nd session
July 1977	.TSPP, 3rd session
September 1977	Subcommittee on Safety of Navigation, 20th session
October 1977	Joint MSC/MEPC Meeting
December 1977	.MEPC, 8th session

1.5 THE PRESENT INTERNATIONAL AGREEMENTS

In 1973 IMCO convened an International Conference on Marine Pollution which adopted an International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73), which would supersede the 1954 Oil Pollution Convention (as amended). This Convention broadened earlier regulations for dealing with oil pollution from ships and introduced new requirements relating to other forms of pollution such as noxious liquid substances, harmful substances in packaged forms, sewage and garbage.

With respect to the discharge of oil, Annex I of the Convention maintains substantially similar criteria to those specified in the 1969 Amendments to the 1954 Oil Pollution Convention but also contains several new requirements which will have profound effects particularly on the operations of oil tankers. These are:

(a) the definition of "oil" has been broadened to mean petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products (other than petrochemicals);

(b) for new tankers, the total quantity of oil which may be discharged into the sea due to operations must not exceed 1/30,000 of the total quantity of the particular cargo of which the residue formed a part;

(c) oil tankers must be fitted with oil discharge monitoring and control equipment, including a recording device to provide a continuous record of any discharge;

(d) any ship of 400 gross tonnage and above must be fitted with an oily-water separating equipment or filtering system;

(e) certain regions, including the Mediterranean Sea, the Black Sea, the Baltic Sea, the Red Sea, and the "Gulfs area" have been designated as "special areas" in which any discharge of oil or oily mixture into the sea is prohibited except in cases of "force majeure";

(f) Parties to the Convention are obliged to ensure the provision of adequate reception facilities for residues and oily mixtures at oil loading terminals, repair ports and in other ports in which ships have such residues to discharge; in certain special areas these facilities must be provided by 1 January 1977 and must be adequate for the reception and

treatment of all the dirty ballast and tank washings from tankers.

In addition, the 1973 Convention introduces certain requirements for the construction and equipment of ships with respect to the prevention of operational discharges of oil and the mitigation of uncontrolled release of oil should accidents to tankers occur. The following is a summary of these requirements:

(a) oil tankers must be provided with suitable slop tank arrangements with the capacity necessary to retain the slops generated by tank washing, oil residues and dirty ballast residues;

(b) new oil tankers of 70,000 tons deadweight and above must be provided with segregated ballast tanks of sufficient capacity to enable them to operate safely on ballast voyages without recourse to the use of oil tanks for water ballast except in very severe weather conditions;

(c) requirements for tank arrangement and limitation of tank size adopted as the 1971 Amendments to the 1954 Convention have been retained;

(d) new subdivision and damage stability requirements have been introduced to ensure that tankers can survive assumed side or bottom damage to a degree specified on the basis of their length.

The Convention will enter into force twelve months after acceptance by at least 15 countries, including those representing at least 50 percent of the gross tonnage of the world's merchant shipping. At present the Convention has been ratified by three countries.

In 1974 IMCO convened an International Conference on Safety of Life at Sea which adopted a new International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), which would supersede the 1960 Safety Convention and also introduced simplified procedures for amending technical provisions. SOLAS 74 includes requirements for inert gas systems for new tankers over 100,000 DWT and new combination carriers over 50,000 DWT.
The inspection and certification, steering, and radar requirements are essentially the same as those contained in SOLAS 60, except that IMCO Resolution A.325(IX), adopted by the Assembly on 12 November 1975, contains standards to improve the operation and reliability of steering gear. The

Assembly in its resolution recommended that the Maritime Safety Committee seek to achieve these standards as amendments to SOLAS '74 after its entry into force.

SOLAS 74 will enter into force twelve months after acceptance by at least twenty-five countries, the combined merchant fleets of which constitute not less than fifty percent of the gross tonnage of the world's merchant shipping. Ten countries have ratified SOLAS 74. SOLAS 74 was submitted to the Senate for ratification in August 1976.

1.6 ISSUES BEFORE THE FEBRUARY CONFERENCE

The objective of the February Tanker Safety and Pollution Prevention Conference (TSPP) is to develop two protocols,[7] one modifying MARPOL 73, and a second modifying SOLAS 74.

The issues to be discussed at the February Conference are:

- LEGAL INSTRUMENTS TO BE USED TO MODIFY THE EXISTING CONVENTIONS
- INSPECTION AND CERTIFICATION OF TANKERS
- IMPROVED EMERGENCY STEERING REQUIREMENTS
- RADAR AND COLLISION AVOIDANCE AIDS
- DOUBLE BOTTOMS OR PROTECTIVE LOCATION OF SEGREGATED BALLAST TANKS
- SEGREGATED BALLAST TANKS AND ALTERNATIVE OR INTERIM MEASURES
- INERT GAS SYSTEMS

As a result of the meetings listed in Table 1, agreement has been reached on a number of the proposals introduced by the United States, and the other issues have been examined in depth and further developed to a point such that they can be considered by the February Conference.[8]

The International aspects of efforts to implement the Presidential Initiatives are summarized in Table 2.

Table 2
TANKER SAFETY AND POLLUTION PREVENTION MEASURES

PRESIDENTIAL INITIATIVES	DOMESTIC ACTION REQUIRED	INTERNATIONAL ACTION REQUIRED
Ratification of MARPOL 73	yes	international implications
Reform of Ship construction and equipment standards Double bottoms Segregated ballast Inert Gas systems Second radar and collision avoidance assistance Improved emergency steering	yes proposed regulations published 5/16/77	yes * TSPP Conference February 1978
Improve International System of inspection and certification	no	yes * TSPP conference
Improve crew standards and training U.S. requirements International requirements	yes no	no yes-June Conf.
Expanded tanker boarding program and marine safety information system	yes	no
Approve oil pollution liability and compensation legislation	yes	International implications
Improve Federal ability to respond to oil pollution emergencies	yes	no

* Treated in this impact statement

1.7 RELATIONSHIP OF THIS ACTION TO PREVIOUS U.S. ACTIONS

The U.S. proposals covered in this impact statement are consistent with national regulations published as proposed rules in the Federal Register on 16 May 1977.[3] The primary thrust of this action, and previous U.S. actions since MARPOL '73 is the reduction of both accidental and operational pollution of the seas by oil from tankers. The previous U.S. actions are:

October 1973 - Completion of MARPOL '73 in London, England. The U.S. has not ratified MARPOL '73 yet, but the convention was submitted to the Senate on 22 March 1977 for advice and consent. (By regulation, however, the U.S. has in effect implemented Annex I of the Convention dealing with oil pollution.) Three countries have ratified MARPOL '73 but it is not yet in force.

November 1974 - Completion of SOLAS '74 in London, England. The U.S. has not ratified SOLAS '74, but the convention was submitted to the Senate on 31 August 1976 for advice and consent. Ten countries have ratified SOLAS '74 but it is not yet in force.

14 October 1975 - Final U.S. regulations were published making segregated ballast tanks (SBT) and operational discharge standards of MARPOL '73 applicable to U.S. flag tank vessels in the domestic trade.

8 January 1976 - Final requirements were published for the defensive placement of segregated ballast on new U.S. tank vessels over 70,000 DWT in domestic trade.

13 December 1976 - Final U.S. regulations were published extending the application of SBT and operational discharge standards of MARPOL '73 to U.S. flag tank vessels in foreign trade and foreign tank vessels in the navigable waters of the U.S. These regulations also extend requirements for defensive placement of segregated ballast to new U.S. vessels in foreign trade and to new foreign-flag vessels entering U.S. waters.

16 May 1977 - Proposed U.S. regulations were published in response to the Presidential Initiatives which would require SBT on additional tankers and double bottoms on new tankers. Improved emergency steering standards, a second radar system with a computer aided collision avoidance system and inert gas systems were also proposed.

1.8 RELATIONSHIP OF THIS ENVIRONMENTAL IMPACT STATEMENT TO PREVIOUS STATEMENTS AND STUDIES

The concept, purpose, costs, benefits, and expected impact of segregated ballast and double bottoms have been discussed at length in previous Environmental Impact Statements, Inflationary Impact Statements, study reports, articles and other documents. Rather than repeating this information, it can be found in the documents of the REFERENCES section of this statement. New information is discussed where necessary to help assess specific proposed actions.

FOOTNOTES

[1]For more detailed information regarding Executive department action leading to the March 17, 1977 announcement, see reference 13.

[2]The White House Fact Sheet -- "Actions to Reduce Maritime Oil Pollution," March 18, 1977.

[3]See Appendix A for the complete text of the President's message to the Congress dated March 17, 1977.

[4]Federal Register, Volume 42, No. 94, Monday May 16, 1977.

[5]"New" in this context means a ship the keel of which is laid or which is at a similar stage of construction on or after the date of coming into force of the present convention.

[6]"Combination carrier" is a tanker designed to carry oil or alternatively solid cargoes in bulk.

[7]A protocol is a legal instrument which can modify an international convention that is not in force.

[8]See reference 14 for summary of the discussions and the conclusions reached by the October Joint MSC/MEPC Meeting where proposals to be put before the Conference were formulated and documented.

2. DESCRIPTION AND PURPOSE OF THE ACTION

2.1 PURPOSE OF THE ACTION

The United States will participate in the International Conference on Tanker Safety and Pollution Prevention, 6-17 February 1978, at London, England. The prime objective of U. S. participation at this Conference is to obtain international action to improve tanker safety and pollution prevention standards. The changes being sought are aimed at reducing oil pollution caused by tanker accidents and routine operational discharges and at reducing the risk of tanker accidents and resulting loss of life and property damage.

The need for reduction of the amount of oil entering the marine environment and the specific benefits of these measures are discussed in Section 3 of this statement.

2.2 DESCRIPTION OF THE PROPOSED ACTION

The Conference will consider proposals made by the United States to modify MARPOL 73 and SOLAS 74, along with alternative proposals developed by other IMCO member nations during preparatory meetings for the Conference. These proposals cover two of the areas covered by the Presidential Iniatives: (1) Ship construction and equipment standards, and (2) inspection and certification of tankers.

2.2.1 Ship Construction and Equipment Standards

2.2.1.1 Double bottoms or protective location of segregated ballast tanks as an alternative to double bottoms (new ships).

The United States proposal would require a double bottom beneath the cargo carrying portion of a seagoing oil tank vessel's hull if the vessel is 20,000 tons DWT or more and is constructed under a contract awarded after December 31, 1979. A double bottom is a cellular construction at a vessel's bottom in which a flat inner skin, or tank top, is placed above and parallel to the vessel's bottom, covering the bottom framing members. This construction results in a series of "double bottom" tanks underneath the vessel's cargo spaces.

The double bottom would be required to have a minimum height, i.e., separation between inner bottom plating and bottom shell plating, of at least the molded breadth divided

.y (3/15) or two meters, whichever is less. The double bottom tanks could be used for segregated ballast, but could not be used for oil, either cargo or fuel.

Realizing that many other delegations have strong reservations for various reasons about an international requirement for double bottoms, an alternative concept capable of providing equal or near equal protection must receive consideration. Protective location of segregated ballast tanks may be such an alternative concept.

Any alternative to the U.S. proposal for double bottoms should provide comparable benefits in reduction of both accidental oil outflow and improvement to safety. There are differences of opinion regarding how best to utilize segregated ballast tanks as protective spaces and uncertainties regarding basic information (such as accident probability and severity, probable damage location along the ship's length and around its girth, longitudinal and girthwise extent of damage and penetration, and effect of various schemes on safety, oil outflow, stability, cost, etc.). Much progress has been made in reducing these uncertainties - submission of some 98 preliminary ship designs and efforts to present and analyze information for grounding and collision accidents and resulting oil outflows are notable examples. Development of more rational approaches or formulae taking into account statistical data on size and position of damage as well as resulting oil outflow will take some additional time.

A formula specifying the desired area of side and bottom shell to be protected as a function of total side and bottom shell areas within the cargo tank length as a constraint for location of segregated ballast tanks could be a satisfactory approach to protective location of SBT provided the following questions are answered:

1. What portion of the total shell area should be protected?

2. What minimum separation distance between shell plating and the tank to be protected should be specified for vessel side and bottom?

Present U.S. standards for segregated ballast spaces require distribution to protect at least 45% of the total side and bottom shell area within the cargo tank length. Proposed national regulations for double bottoms require at least a two meter separation between cargo tank boundaries and shell

plating. At least a 2 meter separation between cargo tank boundaries and side shell plating should also apply to any proposal regarding protective location of SBT.

These constraints would require new tankers to be built with double bottoms, double sides, staggered wings (with wing bulkheads located further outboard then is usual today), or some combination of these. Based on review of the preliminary ship designs prepared for the joint MSC/MEPC meeting and experience with the current national SBT/PL regulations, 45% coverage may be achieved with reasonable changes to current design practice. A 2 meter double bottom should eliminate or substantially reduce oil outflow in the large majority of grounding incidents.

With regard to side protection it is recognized that with a given volume of segregated ballast spaces, a trade off exists between total area of protection and depth of provided protection. A relatively small area (with large depth) can be protected against most hazards, including fire or explosion following a major collision, or a relatively large area (with lesser depth) can be protected against some hazards. Protective location of SBT should afford large areas with some hazard protection.

Some pertinent questions regarding protective location of SBT are:

a. What constraints should be placed on location of SBT,

b. What effects will these constraints have on tanker design,

c. What effect will these changes in tanker design have on:

   1. Oil outflows, both operational and accidental, resulting from collision or grounding,

   2. Safety, particularly risk of fire, explosion or asphyxiation during tank entry,

   3. Cost, both initial and operating,

   4. Vessel operation,

   5. Vessel salvage following collision or grounding.

2.2.1.2 Segregated ballast tanks and alternative or interim measures.

2.2.1.2.1 Segregated Ballast

The U.S. proposal would require that all seagoing oil tank vessels (new and existing) of 20,000 DWT or more have a segregated ballast capability. Vessels would have to be equipped with segregated ballast tanks which are completely separated from the cargo oil and oil fuel systems and which are permanently allocated to the carriage of water ballast. Enough segregated ballast capacity must be provided to enable the vessel to meet specific minimum draft and maximum trim requirements in any ballast condition at any stage of a ballast voyage, including the condition of lightweight plus segregated ballast only. The propeller must also be fully immersed.

The intent of this requirement is to provide vessels with enough segregated ballast capacity that the ship may be operated safely on ballast voyages without putting water ballast in oil tanks except in unusually severe weather. The master of the vessel would be permitted to place additional ballast water in oil tanks in cases where he feels it must be done for the safety of the ship.

2.2.1.2.2 Clean Ballast

During preparatory meetings, the concept of clean ballast tanks was proposed as an interim means of phasing in segregated ballast, without distortion of competition among vessel operators. This concept can be quickly implemented on all vessels since piping and tank arrangement modifications are not required.

The Clean Ballast Tank (CBT) system is a method whereby certain tanks within the cargo area of the ship are dedicated for the carriage of clean ballast water. The piping and pumping systems can be common for both ballast water and the cargo. Structural modifications are not necessary for the implementation of a clean ballast system in existing ships (other than free-flow tankers). The capacity of dedicated clean ballast tanks must be sufficient so that additional ballast is not normally needed (the same minimum capacity as for segregated ballast).

The implementation of CBT eliminates the oil/water mixture created by dirty ballast water under anticipated weather conditions and therefore the need for washing those tanks dedicated to CBT. When located against the shell of the

ship, clean ballast tanks may provide a defensive space to reduce oil outflow in the event of collision or grounding.

The clean ballast concept has the following disadvantages as opposed to the segregated ballast concept:

1. There is the need to flush out the common cargo/ballast piping to prevent oil/water mixture in the clean ballast tank. Failure to properly flush out the piping may result in significant pollution.

2. Since common cargo/ballast piping is utilized, the risk of contamination due to leakage is increased.

3. Enforcement is difficult because the effectiveness of CBT is dependent upon good operating practice, rather than built-in design features.

4. An excess of tonnage may be removed from cargo carriage in order to meet CBT requirements. In addition to meeting draft requirements, selection of tanks for CBT must also satisfy ship loading limitations and pumping needs. Thus in some cases the selection of tanks dedicated for CBT will require more than just the optimal amount of ballast to meet the draft criteria, resulting in "wasted" deadweight capacity.

The clean ballast tank concept would be utilized as an interim measure prior to the implementation of segregated ballast in alternative proposals being recommended for consideration by the IMCO Conference. The United States has added this concept to its original proposal. It will not replace the requirement for segregated ballast but will, for the time it takes to implement segregated ballast, offer a significant improvement.

2.2.1.2.3 Crude Oil Washing

Crude Oil Washing (COW) is a tank cleaning procedure proposed by the United Kingdom and supported by others as an alternative to the retrofit of Segregated Ballast Tanks (SBT) on existing crude carriers of 70,000 or more DWT.

The cleaning procedure is similar to conventional tank cleaning with seawater, except that crude oil is used as the washing medium. Its application consists of crude oil discharged through fixed tank washing machines positioned so that oil impingement upon internal tank bulkheads and structures results in a cleansing action of the oil residue remaining after cargo discharge. Being thixotropic, the

spray action and subsequent run-down places oil residue back into suspension so that the combination of remaining cargo and residue can be collected by the installed stripping system and discharged into another cargo tank or ashore with the rest of the cargo.

Thus COW is generally performed while discharging cargo, rather than at sea where conventional tank washing is done. Clean ballast tanks can be achieved by water rinsing the tanks following a crude oil wash and prior to ballasting.

There are technical questions which must be answered to assess COW as an alternative to SBT retrofit. Significant questions together with some responses to these questions are as follows:

1. How is the level of desired effectiveness defined?

The level of effectiveness is best defined as a crude oil washed cargo tank being nearly free from oil and sediment. In this regard an optimal level of effectiveness would be attained when a crude oil washing system removed sufficient oil and residue so as to make water washing unnecessary. The objective is to be able to discharge the ballast contents of such a tank directly into the sea without violating the discharge standards of MARPOL 73.

2. How is the proper number and location of fixed washing machines determined?

Two methods can be used. One method utilizes shadow diagrams where lines are drawn from tips of the washing machines to parts of the tank to be washed. This method identifies "shadow areas" where direct impingement may not occur and splash-back effect and run down will have to be relied upon for cleaning. The other method, used in more complicated tank structures, relies on a pin-point light source to identify similar areas. The ultimate determination of course is a visual inspection of a tank following a crude oil wash.

3. How is adequate stripping and tank drainage defined?

Adequate stripping and tank drainage are achieved when the tank bottom is dry following crude oil and water wash cycles. In this regard, the comments set forth to question #1 above apply. Adequate stripping and drainage necessitates that the capacity of the stripping system be

sized to exceed the combined capacity of all tank washing machines which may be operating at any one time.

4. How is the influence of different types of crude oil on crude oil washing effectiveness determined?

This can be done by utilizing different crude oils for COW and determining effectiveness as discussed in comments to question #1. Most experience has been gained with Arabian crudes, while no experience has been reported with crude oils from the Western hemisphere.

5. How is it insured that properly trained crews are aboard, including adequate manning during the period when close supervision is essential?

Qualifications for persons to assume charge of crude oil washing operations must include previous experience with COW or completion of an approved training program. Further, such a person should be familiar with the specific equipment aboard that ship and the content of its Operation and Equipment Manual. Other persons responsible for particular COW operations should have commensurate experience and/or training.

6. What control measures can be established to insure desired effectiveness?

Good initial design of the COW system, particularly with regard to location of fixed washing machines and adequacy of the stripping system is an important measure to insure COW effectiveness. Other measures include crew training, examination of oil record books, tank inspection, and examination of ballast discharge.

The following advantages and disadvantages have been identified with COW:

Advantages

The primary advantage of crude oil washing is that it provides a method whereby nearly all residue and sediment can be removed from cargo tanks and discharged with the cargo. This in turn provides two benefits; one in the form of increased economic return because of greater cargo outturn, and the other in the form of a reduction in potential for operational pollution.

The potential for operational pollution is reduced because of the relatively small quantities of oil/water mixtures which must be handled following a crude oil washing cycle. These reductions are accounted for as follows:

Cargo tank utilized for clean ballast (arrival ballast) require only a short water rinse,

Cargo tanks utilized for dirty ballast (departure ballast) have only small quantities of oil remaining,

Cargo tanks not required for ballast need no water washing.

Tanker operators have an economic incentive to perform COW because of expected greater and more consistent outturn of cargo. Further, because less seawater is introduced into cargo tanks and piping, cargo is of slightly higher quality. Removal of residue from cargo tanks by COW, while enabling vessels to maintain consistent deadweight capacity, reduce both periodic cleaning costs and cost of preparation for shipyard entry. This in turn contributes towards a reduction in potential for operational pollution.

COW has proven to be cost effective on large tankers.

Disadvantages

a. More time is required at the terminals if COW cannot be completed within the time alloted for discharge of cargo. This is a function of the ability of specific terminals to receive cargo and the number of tanks to be cleaned.

b. Some types of crude oil probably cannot be used in the COW process.

c. COW can result in an increased level of cargo vapors being discharged to the atmosphere. This occurs when tanks are ballasted following a crude oil wash. Prevention requires simultaneous ballasting and cargo discharge with commensurate piping design to allow "cascading" of vapors from one tank to the next. This becomes more complicated because trim requirements must also be taken into consideration.

d. Effective COW is dependent upon operational procedures and equipment maintenance as well as good design.

In addition to technical questions which must be answered regarding COW, the application of COW as an alternative to SBT raises additional issues.

For safety reasons COW requires that an Inert Gas System be installed and used; therefore, the economic incentive for COW diminishes as vessel size decreases. These costs stay nearly constant while the benefits decrease in proportion to vessel size. Thus, as vessel size decreases, so does the economic incentive for its installation. The size vessel where COW becomes unattractive is not precisely known and is affected by additional factors such as vessel age, crew qualifications, design and capacity of installed stripping systems, and terminal receiving capabilities. However, if inert gas systems are required for all tank vessels the economic incentive for COW increases.

Crude oil washing applies as its name suggests - to crude carriers. Because it cannot be used aboard product carriers, it cannot be considered as an alternative for SBT aboard those vessels, which generally are smaller than crude carriers.

Thus, at least for the present, application of COW is best suited for installation aboard large crude carriers.

2.2.1.3 Inert gas systems.

The U.S. proposal would require that an inert gas system (IGS) be fitted on all tank vessels of 20,000 DWT or more. An inert gas system is a method for providing a gas or mixture of gases to the cargo tanks so deficient in oxygen that the atmosphere within a tank may be rendered inert, i.e., incapable of propagating flame. The capacity of the system together with the method of operation and control is such as will enable an inert condition to be safely maintained within the cargo tank spaces at any time during the commercial operating cycle of the vessel.

In addition to protecting the tanks from explosion during tank cleaning operations (when it is the most critical) and any other time when the tanks are not undergoing tank cleaning, a good quality inert gas reduces internal tank corrosion and can produce higher cargo discharge rates by utilizing the IGS pressure to aid the cargo pumps, thereby reducing tank vessel turn around time.

2.2.1.4 "Package" proposals.

The Joint MSC/MEPC Meeting held in October 1977 recognized that the questions of segregated ballast tanks, alternative and interim measures (e.g., clean ballast tanks, crude oil washing), and inert gas systems were closely related to each other. In developing alternative proposals to be considered at the February Conference, the Joint Meeting agreed that alternative proposals for SBT, CBT, COW, and IGS should take the form of "package" proposals addressing specific alternatives and indicating the extent of application of the requirements to:

- new or existing oil tankers;
- crude oil tankers or product carriers;
- deadweight of ships above which requirements should apply;
- date from which the requirements should become effective.

At the Joint Meeting, numerous specific proposals containing these elements were put forward by delegations. These were reduced to two major package proposals, i.e., Package 1 and Package 2, each containing proposed draft texts for inclusion in Protocols modifying MARPOL 73 and SOLAS 74. These two "package" proposals will be considered, along with the original United States proposal for SBT and IGS at the February Conference. These "package" proposals are shown in Tables 3, 4, and 5.

2.2.1.5 Radar and collision avoidance aids.

The United States proposal would require all ships of 10,000 tons gross tonnage and upwards to be fitted with two radars each capable of operating independently of the other and each of a type approved by the Flag State. Primarily, this would provide a "back up" in the event of failure of the primary radar. Additionally, however, it would improve the information gathering capability of the vessel by permitting one X-band and one S-band device, or by having one radar on long range for navigation while the other is on short range for maneuvering, or one for the pilot, one for the master/mate, etc.

The United States also proposed that all ships of 10,000 tons gross tonnage and upward be fitted with collision avoidance aids (CAA's) capable of operating in accordance with internationally agreed operational standards developed

Table 3

United States Proposal

	CRUDE CARRIERS		PRODUCT CARRIERS (Black and White Oils)	
	NEW SHIPS	EXISTING SHIPS	NEW SHIPS	EXISTING SHIPS
CLEAN BALLAST TANKS				
(a) Non-free-flow ships				
(i) Tonnage limit (dwt)		20,000		20,000
(ii) Implementation		6/78 to 6/82		6/78 to 6/82
(b) Free-flow ships				
(i) Tonnage limit (dwt)		20,000		20,000
(ii) Implementation		6/78 to 6/82		6/78 to 6/82
SEGREGATED BALLAST TANKS				
(i) Tonnage limit (dwt)	20,000	20,000	20,000	20,000
(ii) Implementation	6/82	6/82	6/82	6/82
INERT GAS				
(Applicable to oils with a flash point below 60° C)				
(i) Tonnage limit (dwt)	20,000	20,000	20,000	20,000
(ii) Implementation	6/82	6/82	6/82	6/82
CRUDE OIL WASHING				
(i) Tonnage limit (dwt)				
(ii) Implementation				

Table 4

Package 1

	CRUDE CARRIERS		PRODUCT CARRIERS (Black and White Oils)	
	NEW SHIPS	EXISTING SHIPS	NEW SHIPS	EXISTING SHIPS
CLEAN BALLAST TANKS				
(a) Non-free-flow ships				
(i) Tonnage limit (dwt)		20,000		50,000
(ii) Implementation		H to H + 2 years		H to H + 2 years
(b) Free-flow ships				
(i) Tonnage limit (dwt)		DW reduction only 20,000		
(ii) Implementation		H to H + 2 years		
SEGREGATED BALLAST TANKS				
(i) Tonnage limit (dwt)	20,000	20,000	20,000	50,000
(ii) Implementation	H	H + 2 years	H	H + 5 years
INERT GAS (Applicable to oils with a flash point below 60° C)				
(i) Tonnage limit (dwt)	20,000	20,000	50,000	50,000
(ii) Implementation	H	H + 5 years	H	H + 5 years
CRUDE OIL WASHING				
(i) Tonnage limit (dwt)	COW must comply with IMCO procedures if used	COW must comply with IMCO procedures if used	COW must comply with IMCO procedures if used	COW must comply with IMCO procedures if used
(ii) Implementation				

H = date of entry into force

Table 5

Package 2

	CRUDE CARRIERS		PRODUCT CARRIERS (Black and White Oils)	
	NEW SHIPS	EXISTING SHIPS	NEW SHIPS	EXISTING SHIPS
CLEAN BALLAST TANKS				
(a) Non-free-flow ships				
(i) Tonnage limit (dwt)				
(ii) Implementation				
(b) Free-flow ships				
(i) Tonnage limit (dwt)				
(ii) Implementation				
SEGREGATED BALLAST TANKS				
(i) Tonnage limit (dwt)	70,000 MARPOL 73	70,000 (or COW alt)	70,000 MARPOL 73	
(ii) Implementation		H + 3 years		
INERT GAS (Applicable to oils with a flash point below 60° C)				
(i) Tonnage limit (dwt)	50,000 or 20,000W.M.	50,000 or 20,000W.M.	100,000 or 50,000W.M.	70,000W.M.
(ii) Implementation	H + 3 years	H + 3 years	H	H + 3 years
CRUDE OIL WASHING				
(i) Tonnage limit (dwt)		70,000		
(ii) Implementation		H + 3 years		

H = date of entry into force
WM = fitted with fixed washing machines of capacity greater than 60 m^3/hr

by the Organization (IMCO). The joint meeting of the MSC/MEPC was of the opinion that a mandatory requirement of such an aid would be premature at this stage until internationally agreed user requirements and operational performance standards for such aids have been developed. It was agreed that these standards should be prepared as a matter of urgency and when completed should be made a mandatory requirement. These standards shall be developed by 1 July 1979. The U.S. did not agree with this position in its entirety--desiring that mandatory installation be required immediately upon standards development for the equipment.

A collision avoidance aid enhances the safety and efficiency of a vessel in several ways. With an acquisition alarm, it can alert the watchstander to new threats early on, as they appear on the scope. It relieves him of the need to manually plot contacts, thereby freeing him to continue other vital tasks while providing him with a threat evaluation in 30-60 seconds. A manual solution can take 6-9 minutes. More complex aids can provide him with safe maneuver information or even evaluate the "outcome" of a trial maneuver. Overall, a CAA provides the watchstanders with accurate threat information when operating in certain areas and the time to evaluate and act on it. This provides a safer maneuvering capability and provides the mariner with a better knowledge and understanding of his overall situation.

2.2.1.6 Improved emergency steering standards

The United States submitted a general proposal to improve the steering capability of new and existing oil tankers of 20,000 DWT or greater at the 3rd session of the Tanker Safety and Pollution Prevention working group of IMCO. The proposed improvement in steering capability should reduce the probability of collisions and grounding of tankers caused by steering failure and should therefore, reduce the risk of oil pollution, property damage, personal injury and death that could result from such accidents.

The proposal would require each oil tanker of 20,000 DWT or more that uses a full follow-up type steering gear control system to have a steering failure alarm that would provide an audible and visible warning in the pilothouse. This proposed alarm system is to be separate of each steering gear control system on the vessel, thereby preventing failure of the alarm in the event of a failure of a component of the control system. If the vessel is steered

by means other than the follow-up type, constant use of a rudder angle indicator is necessary; or if automatic steering gear control equipment is used, alarms are built into the equipment. In these means of steering, early warning of a steering failure is provided, precluding the need of an additional warning.

The proposal would also require that a means be provided to recover control of the rudder within 45 seconds after detection of a failure of the steering gear control system in use. This may be accomplished with either two separate and independent steering gear control systems (including differential controllers) or procedures and associated equipment for manning the steering gear spaces or other alternative steering stations.

The Netherlands and the USSR each responded to the U.S. initiative with alternate proposals for improvement of steering gear. The Netherlands proposal contains nearly all the standards of the U.S. proposal and in addition would require new tankers of 20,000 DWT or greater to comply with regulation 13(b) of Resolution A-325(IX). As recommended by the Assembly, this regulation applies to new vessels of 70,000 gross tons and upward and would require two or more identical power units, an alternate steering gear control system, steering gear power unit failure alarms and an automatically activated alternate power supply. The USSR proposal would replace regulations 29 and 30 in SOLAS '74 with regulations 13 and 14 of Resolution A-325(IX) and contains the same application of regulation 13(b) as the Netherland's proposal. Comments and proposals submitted by four other nations favored either minimal change or no change to existing steering gear, stating in principle that additional equipment introduces additional risks. No other proposal offers manning as a means to improve steering gear reliability.

2.2.2 Inspection and Certification

The U.S. proposal recommended the following changes to the inspection and certification regulations of SOLAS 74 to assist in improving the safety of tank vessels:

a. A specific definition for the age of a ship.

b. Require the Flag State to authorize non-governmental nominated surveyors or organizations to board ships without obtaining permission from the owners, to assign certain responsibilities to these organizations and to require that

the administrations carry out ad-hoc interim inspections during the periods of validity of the ships' certificates.

c. Addition of Inert Gas Systems as an equipment to be surveyed prior to issuance of a Cargo Ship Safety Equipment Certificate.

d. Examinations for issuance of Safety Equipment Certificates shall be every 24 months with intermediate examinations when the vessel is over 10 years of age.

e. Examinations for issuance of Safety Construction Certificates shall be every 5 years with an intermediate examination when the tanker is over 10 years of age. Requirements for examinations of tankers have been more clearly defined to identify the special hazard areas such as pump rooms, cargo venting and handling systems and electrical systems in hazardous locations.

f. Tightening of the flag state and port state control of vessels to ensure vessel compliance with regulations, reporting of deficiencies, and investigation of deficient conditions.

2.2.3 Other Issues to be Covered at the Conference

2.2.3.1 Acceleration of entry into force of the Convention and the 1973 MARPOL Convention

The joint MSC/MEPC meeting considered two draft resolutions setting target dates for entry into force of the 1974 SOLAS Convention and the 1973 MARPOL Convention. The following observations were made on the subject:

1. The setting of target dates for the entry into force of the 1974 SOLAS and the 1973 MARPOL Convention was a policy matter to be decided by the February Conference;
2. Although it would be practicable to recommend a target date for the entry into force of the 1974 SOLAS Convention, it would not be possible to make any assesment of a possible entry into force of the 1973 MARPOL Convention at this stage.

It was pointed out that the difficulties in the implementation of the 1973 MARPOL Convention lay not only with Annex II but also with Annex I, such as the availability of the prescribed suitable oil discharge monitoring and control equipment and of adequate reception facilities.

2.2.3.2 Marine Safety Corps

During the discussions at the Maritime Safety Committee, several delegations stressed the importance of effective and universal implementation of existing conventions relating to maritime safety and prevention of marine pollution. It was recognized, however, that due to a shortage of trained maritime experts, many countries found it difficult to ensure the complete observance of these international standards although they recognized fully that the universal observance of such standards was essential for the protection of their own maritime interests including marine environment. In this context a suggestion was made for the establishment, under the aegis of IMCO, of a Marine Safety Corps consisting of a team of maritime experts who would be experienced surveyors possessing high professional qualifications in nautical, engineering or naval architecture disciplines. When a country required technical assistance for the purpose of securing advice on various matters connected with the implementation of international conventions, initially a two-man team drawn from the Marine Safety Corps could undertake a six-week assignment to visit that country for providing the requisite assistance.

The type of assistance which could be provided by experts of the Marine Safety Corps might include the following:

(a) A review of national maritime safety rules and regulations in light of the relevant international Conventions.

(b) Advice on national organizations required to administer and enforce the national rules and regulations relating to maritime safety.

(c) Advice on arrangements for ensuring survey and inspection of ships in accordance with the requirements or relevant international Conventions, Recommendations, etc.

(d) A review of the role of classification societies in the inspection of ships of flag States and of the manner in which surveyors and inspectors in other States might assist.

(e) An examination of the casualty enquiry procedures and advice on the need for improvements required, if any.

(f) Formulation of proposals for longer term technical assistance, where required by the country concerned, until national personnel are available, for developing and

maintaining efficient marine administration and inspection arrangements when experts from other countries are withdrawn.

A draft resolution for consideration by the February Conference calls for IMCO to formulate arrangements for making such advice and assistance available by the establishment and utilization of a Marine Safety Corps.

2.2.3.3 Control of discharges under the 1969 Admendments to the 1954 Oil Pollution Convention

Since contravention of the Oil Pollution Convention generally takes place outside the immediate control and knowledge of the Flag States it is important to insure that there is a ready flow of information concerning alleged contraventions in order to facilitate enforcement by those states. The joint MSC/MEPC meeting prepared a draft Assembly Resolution which contained guidelines suggesting how the information flow may be expedited with the purpose of achieving effective enforcement of the Convention as amended in 1969. The guidelines were drafted in order to facilitate such enforcement, and neither represent any extension of the control procedures provided by the Convention, nor an interpretation of it. The draft resolution was adopted, unchanged, on 14 November 1977 as IMCO Assembly Resolution A391(x), Procedures For the Control of Discharges Under the International Convention for the Prevention of Pollution of the Sea by Oil, 1954 (as amended in 1969).

Along with the above Resolution two other draft resolutions were sent to the Assembly at the same time. These resolutions:

1. Urge that Governments communicate to IMCO information about action taken in respect of ships flying their flags which are reported, in accordance with the provisions for the control of ships of the International Convention for the Safety of Life at Sea, 1960 and of the International Convention on Load Lines, 1966, as not complying fully with the requirements of these Conventions.

2. Recommend that a Contracting Government notify the Organizaion on each occasion in which it furnishes another Contracting Government with particulars in writing of evidence that a ship registered in the latter State's territory has contravened the International Convention for the Prevention of Pollution of the Sea by Oil, 1954 (as amended in 1969).

3. Recommend that the Contracting Government which has received such particulars advise the Organization and the other Contracting Government (within six months of receipt) the results of the investigation which it has taken and that it further advise the Organization and the other Contracting Government of the results of any proceedings taken against the owner or master of the ship when such results are known to it.

These resolutions were adopted by the IMCO Assembly on 14 November 1977 and are part of Resolution A391(x).

3. PROBABLE IMPACT OF THE PROPOSED ACTION ON THE MARINE ENVIRONMENT

3.1 QUESTIONS TO BE ANSWERED

In approaching the problem of assessing U.S. participation in the February TSPP Conference and the possible impacts on the marine environment one can ask the following questions:

1. How does oil pollution from tankers occur?
2. How serious is the problem?
3. What has already been done to correct the problem?
4. Why aren't existing measures adequate, i.e., why are additional steps necessary?
5. What additional steps are proposed?
6. What impact would these changes have on the situation?

We shall consider each of these questions in turn.

1. How does oil pollution occur?

The processes by which oil reaches the oceans as a result of both routine tank vessel operations and tank vessel accidents have been described in previous environmental impact statements and reports. See in particular pages 23-41 of reference (1), pages 11-13 of reference (13), pages 8-9 of reference (15), and pages 6-9 of reference (16).

2. How serious is the problem?

No one knows for sure. There is no general agreement, even among experts. See for example, reference (6), pages 104-107 (reproduced in references (1) and (13)); reference (15), pages 7-8; reference (16), page 17; and reference (18).

3. What has already been done to correct the problem of oil pollution from tankers?

International oil pollution control measures are described in reference (15). Recent changes to U.S. requirements are described in previous environmental impact statements, references (1) and (2).

4. Why aren't these measures adequate, i.e., why are additional steps necessary?

A series of tanker accidents in and around U.S. waters during December 1976 and January 1977 prompted both the Executive Branch of the Federal Government and the Congress to review the "tanker safety and pollution prevention problem" and the measures then in effect to correct the problem. As a result of these review efforts, both the President and members of Congress were convinced that, among other things, changes to tanker construction and equipment, and inspection and certification were necessary. The President announced the program described in Section 1 of this statement, and during 1977 legislation incorporating similar requirements was passed by the Senate and sent to the House for action.

5. What additional steps are proposed?

The steps proposed by President Carter are described in Section 1 of this statement. The various proposals for international action which will be considered by the February TSPP Conference are described in Section 2.2 of this statement.

6. What impact would these changes have on the situation?

Impacts on the marine environment will be discussed in the next two sections. Other impacts will be described in Sections 3.4 through 3.6.

3.2 PROCEDURE FOR ASSESSING IMPACTS ON THE MARINE ENVIRONMENT

We are concerned with three categories of impact on the "human environment":

- operational oil pollution;
- accidental oil pollution;
- deaths, injuries, and property damage.

Here we will adopt the definition of marine pollution attributed to GASAMP in reference (15):

> "Marine pollution means the introduction by man, directly or indirectly, of substances or energy in the marine environment (including estuaries) resulting in such

deleterious effects as harm to living resources, hazard to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of the quality for use of sea-water and reduction of the amenities".

The sequences of "causal factor--condition--effect" for each of these three impact categories is shown in Figures 1, 2, and 3.

Considering first the impacts on operational and accidental oil pollution, we would like to be able to directly assess the impact of the environmental losses (risk of environmental damage) shown at the bottom of Figure 1 and 2 of various proposed changes to ship construction and equipment standards, and inspection and certification requirements. However, our current knowledge of the relationship between oil inputs to the marine environment and risk of environmental damage does not permit such a direct evaluation. About the best we can do at this stage is to estimate the impact of the proposals on the quantity of oil entering the water in two geographical areas:

1. Worldwide, recognizing that the U.S., along with other countries, has an interest in maintaining the quality of the world's oceans as a whole, and

2. in U.S. waters, defined as within 50 miles of the U.S. coastline for purposes of this analysis, recognizing that we may be more concerned about oil inputs close to our shores than further at sea or even adjacent to some other country's shores.

The procedure used for assessing impact of various proposals on oil inputs, deaths, injuries, and property damage is summarized on Figure 4. Referring to Figure 4, information in the top, left, and lower boxes must be combined in an assessment of the impact on the criteria shown in the right-hand box.

In assessing the impact of the various elements of the protocol alternatives on oil outflow, deaths, injuries, and property damage, the following procedure will be used:

1. We will use the term measure to refer to the individual elements of the protocol alternatives, i.e., DB, SBT/PL, SBT, CBT, COW, IGS, etc.

Figure 1 TANK VESSEL OPERATIONAL OIL OUTFLOW SEQUENCES

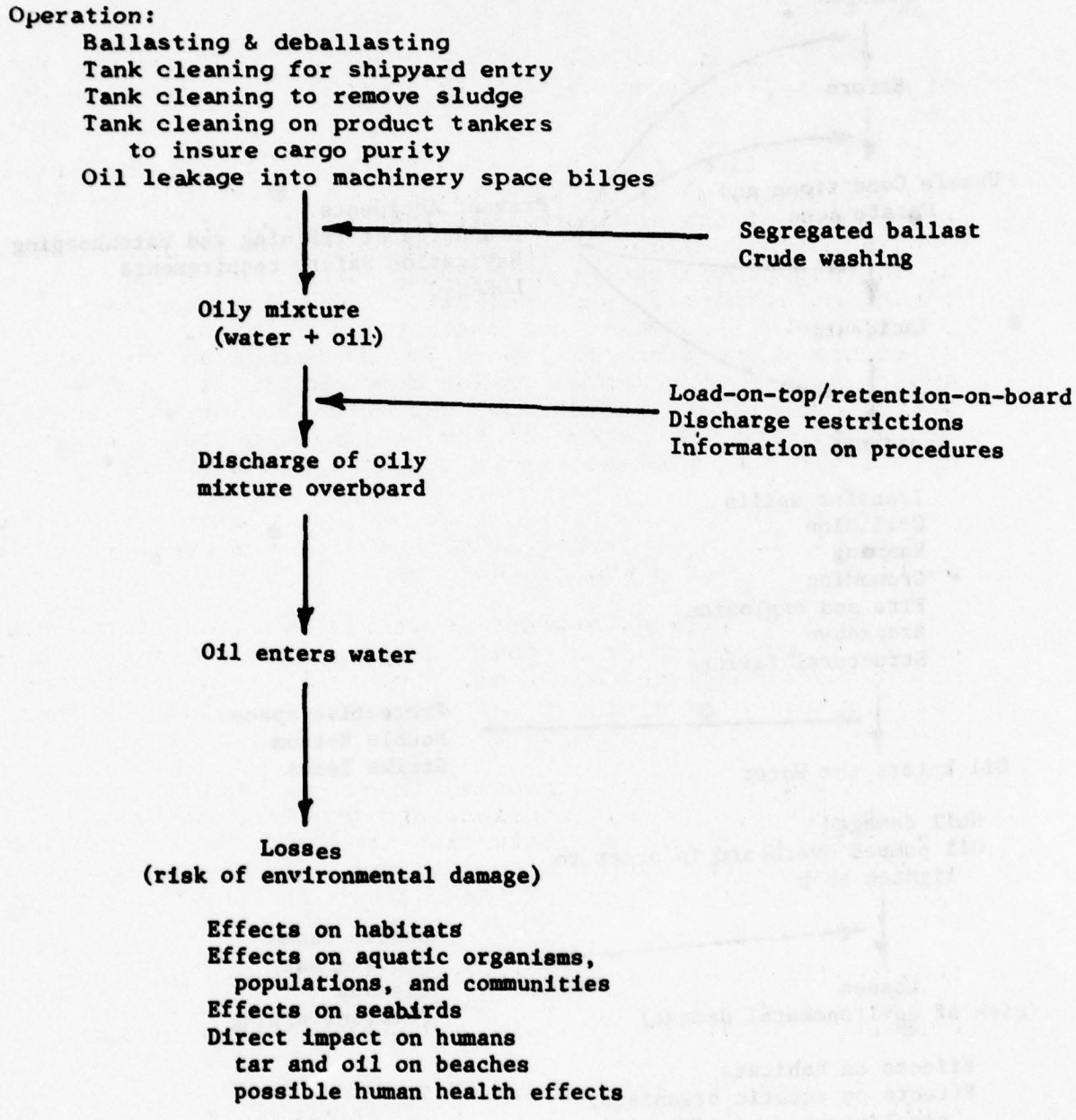
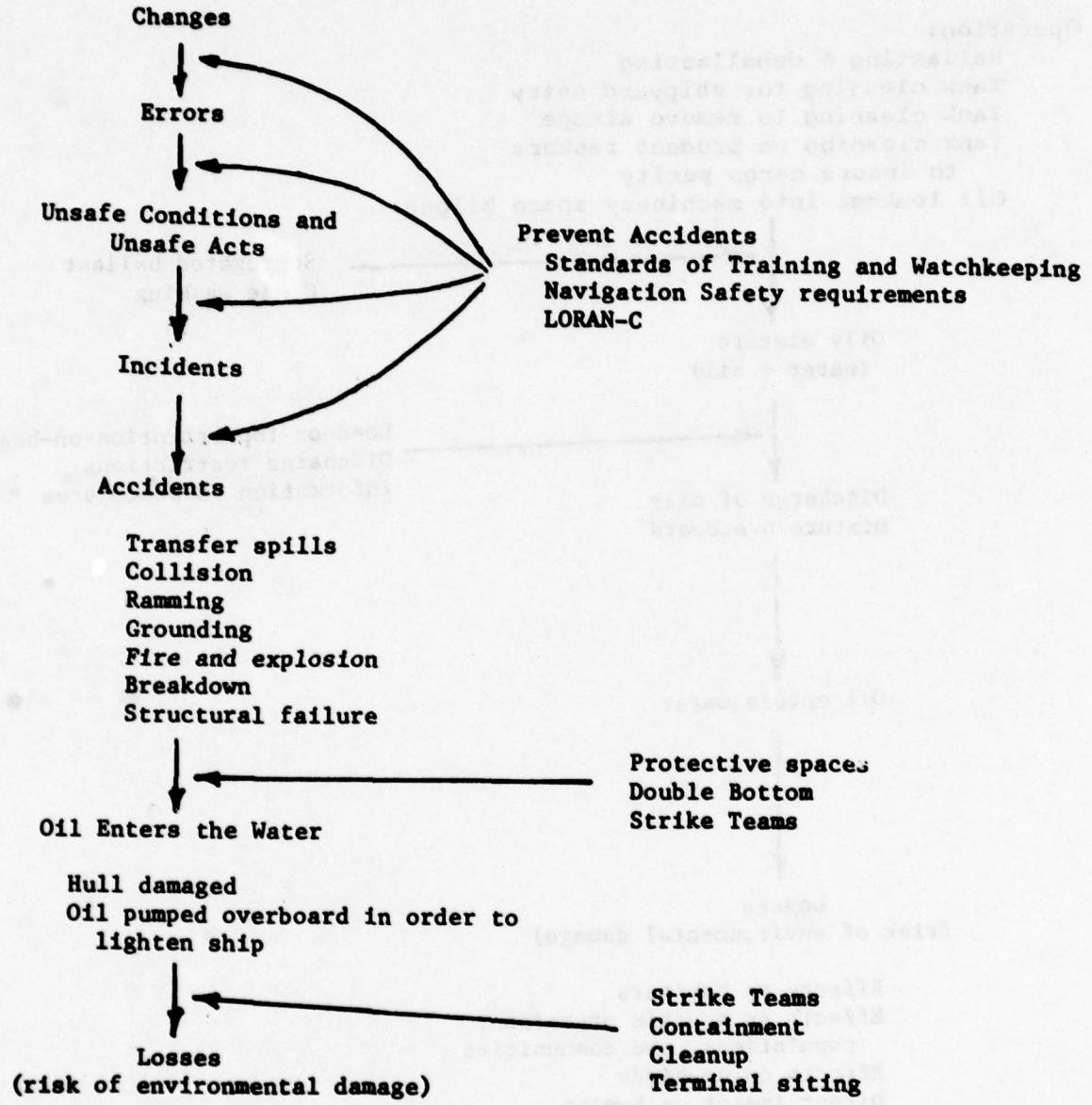


Figure 2 TANK VESSEL ACCIDENTAL OIL OUTFLOW SEQUENCES



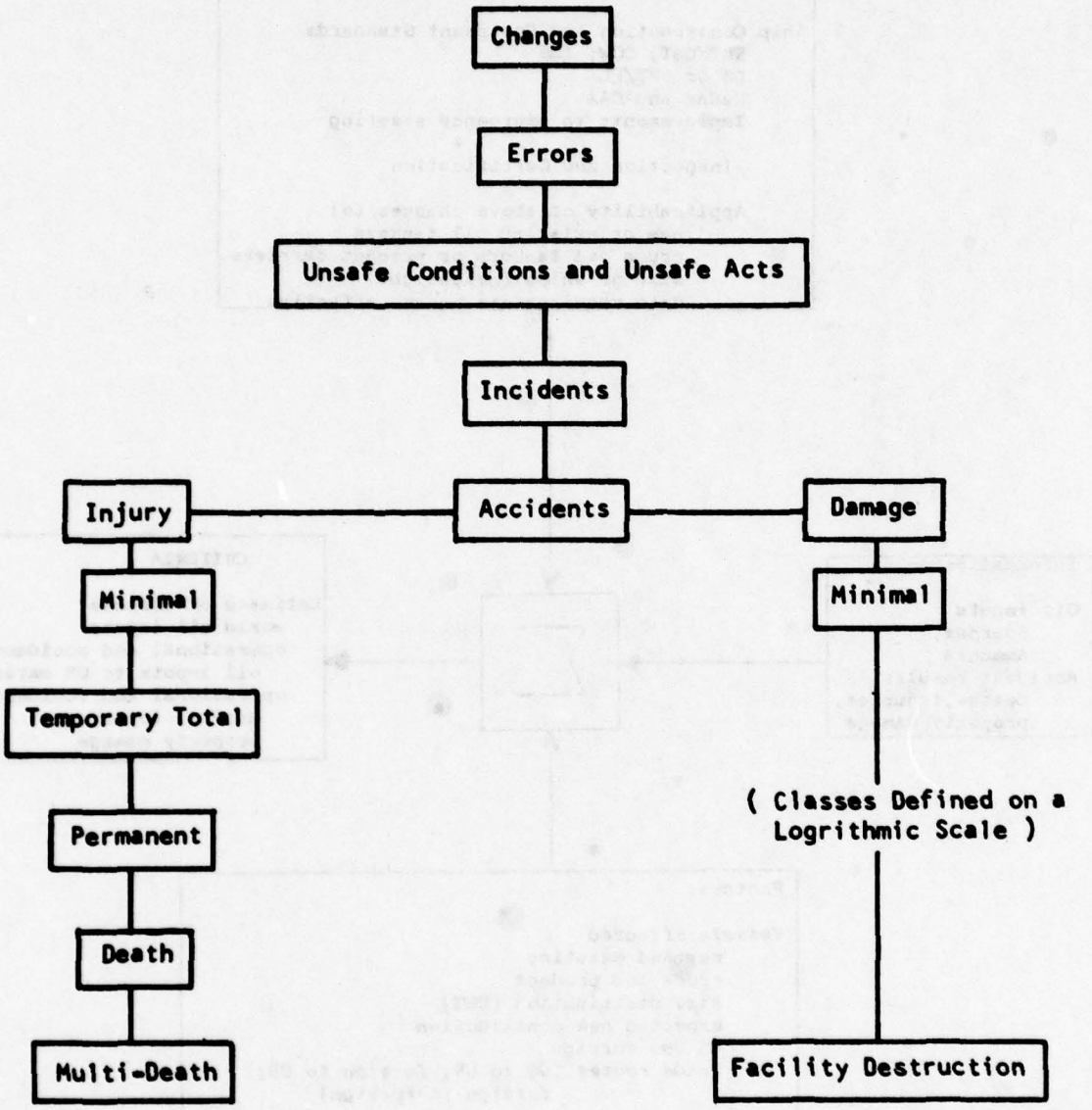


Figure 3 RELATIONSHIP OF ACCIDENT EVENTS

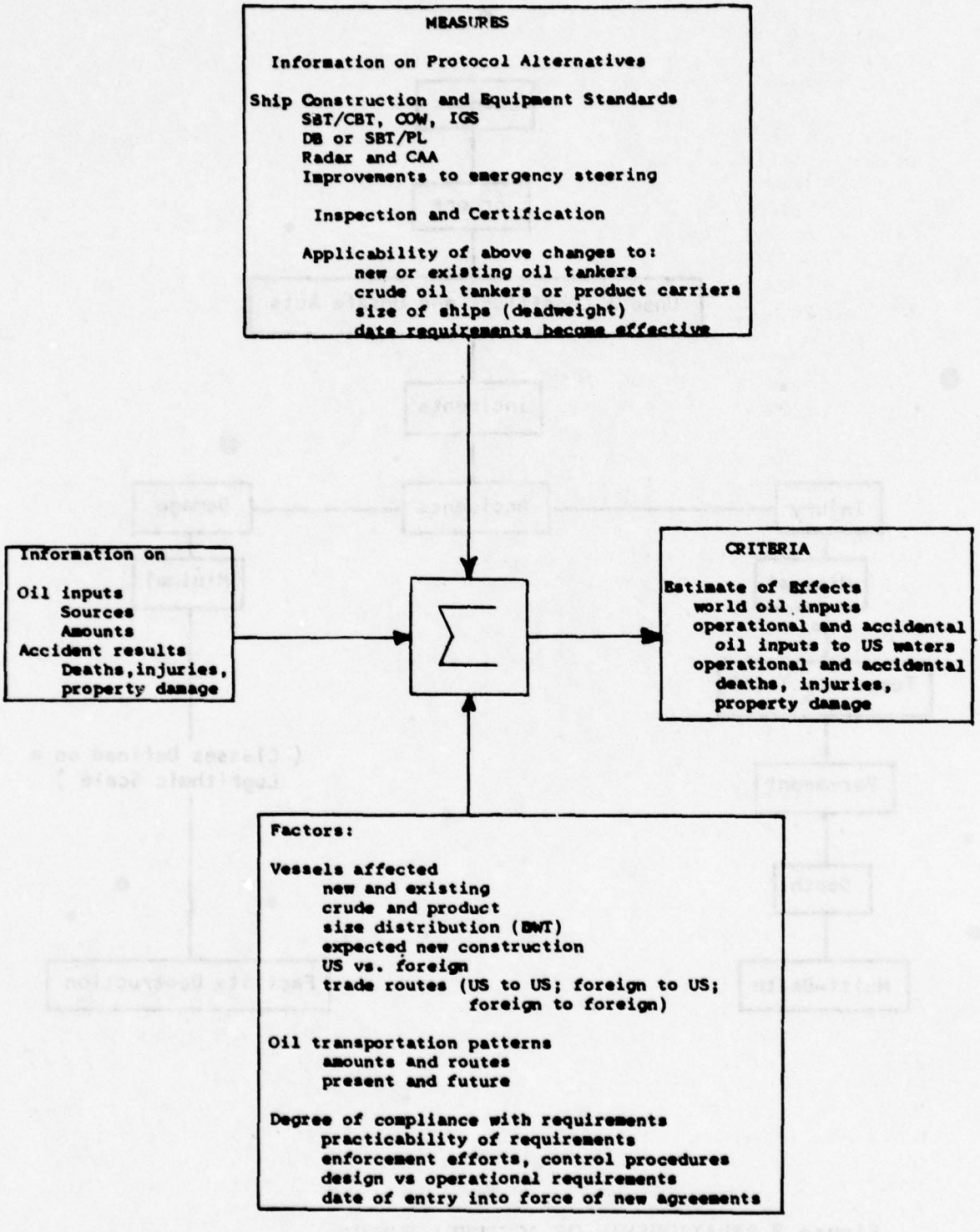


Figure 4 PROCEDURES USED FOR ASSESSING THE IMPACT OF PROTOCOL ALTERNATIVES ON OIL INPUTS AND SAFETY

2. We will use the term criteria to refer collectively to the things we are interested in, i.e., operational and accidental oil inputs and safety (measured in terms of deaths, injuries, and property damage).

3. We will identify which measures are expected to have an impact on which criteria.

4. Then identify how we expect these measures to have an impact on the criteria.

5. Identify what factors we expect to have an influence on the degree of impact the measures will have on the criteria.

6. Attempt to quantitatively assess the degree of impact the measures will have on the criteria.

Table 6 and the notes to Table 6 indicate which of the measures (DB, SBT/PL, SBT, COW, IGS, etc.) are expected to have an impact on each of the criteria. The time and resources available for preparation for the February Conference have not permitted a quantitative evaluation of all the impacts identified in Table 6, taking into account all of the factors indicated at the bottom of Figure 4. A number of the most important impacts have been evaluated and results of these evaluations are presented in the following sections.

3.3 IMPACT OF PROTOCOL ALTERNATIVES ON OIL INPUTS

3.3.1 Worldwide Oil Inputs

Estimated impacts of various pollution control measures on worldwide oil inputs are shown in Table 7 and Figure 5.

These estimates were obtained using the WORLD OIL OUTLFOW MODEL and assumptions described in reference (18). These figures represent an attempt to make a realistic appraisal of the near-term reduction in world wide oil inputs, primarily as a result of SBT retrofit (as contained in the U.S. PROPOSAL and PACKAGE 1) or COW (as proposed in PACKAGE 2.) "Near-term" implies worldwide oil movements are assumed to be the same as 1975 and before significant numbers of "new" vessels with additional features enter service. These estimates do not include any impact that SBT retrofit, COW or IGS might have on accidental oil inputs. At this point, not all of the impacts identified in Table 6 have been included in the model because of time and resource

Table 6

IMPACT OF VARIOUS MEASURES ON CRITERIA

MEASURE	CRITERIA			
	OPERATIONAL OIL INPUTS	ACCIDENTAL OIL INPUTS	SAFETY death, injury damage	OTHER
SHIP CONSTRUCTION AND EQUIPMENT STANDARDS				
Double bottoms (new ships)	1	2	3	4
Protective location of SBT (new ships)	5	6	7	8
Segregated ballast tanks	9	10	11	12
Clean ballast tanks	13	14	15	16
Crude oil wash	17	18	19	20
Inert gas systems	21	22	23	24
Radar and collision avoidance aids	25	26	27	28
Improvements to emergency steering standards	29	30	31	32
INSPECTION AND CERTIFICATION	33	34	35	36

Table 6 (continued)

The following notes attempt to identify which measures may have an impact on each criteria and to explain how these measures are expected to have an impact on the criteria. The objective is to assemble and collate all of the available information on various possible effects the measures may have.

1. The Impact of DB on operational oil inputs.

DB will reduce operational oil inputs by providing better drainage of cargo tanks and reduction of sludge buildup within the tank. (Assuming that stiffening members of inner bottom will be in double bottom.) Cargo discharge is more complete with a double bottom arrangement, so more oil reaches its destination and less is discharged overboard as a result of tank cleaning operations. Tanks are much easier to clean so less water is used in water-washing and quantity of oily mixtures treated by LOT/ROB is reduced. (Ref 13, page 15; ref. 4 page 46)

Since more of the highly structured wing tanks will have to be used for cargo on a DB tanker than on other segregated ballast designs, there will be no significant decrease in the horizontal structure upon which sediment will accumulate and which impedes effective washing. Since horizontal areas are not significantly different for DB case, operational oil inputs will not be reduced. (MSC/MEPC/INF. 15, page 9, by the United Kingdom).

2. Impact of DB on accidental oil outflows.

If new tankers are built with DB, some of the groundings of these vessels that would otherwise result in oil outflows would not result in oil outflow. In cases where grounding of a double bottom tanker does result in oil outflow, the outflow will be smaller than it would have otherwise been due to the "trapping" effect of the double bottom. (Ref 13, page 15; ref 4, page 46)

Double bottoms are unlikely to affect outflows in a situation where a vessel grounds hard and is broken up due to the action of heavy seas.

Double bottoms will not be of benefit in those situations where the vessel does not go aground with sufficient energy to penetrate the bottom shell plating.

3. Impact of DB on Safety

a. Impact of DB on possibility of salvage of a tanker after grounding.

The effect of DB on the possibility of salvage of a grounded tanker is uncertain. If a vessel with empty DB tanks grounds with enough force to penetrate the bottom shell plating, these tanks will be flooded and the resulting loss in buoyancy will mean the vessel will be harder aground than if it did not have double bottom tanks, all other things being equal. This may be a critical factor in salvage of the vessel if weather worsens. On the other hand, the smaller volume of the double bottom tanks (compared to cargo tanks) may reduce the overall loss of buoyancy if the inner

bottom is not penetrated. There are so many variables which affect success of salvage operations that it is impossible to say what effect double bottoms may have on possible salvage of a tanker after grounding. (Variables in salvage: how hard the vessel is aground, bottom conditions, weather, sea conditions, availability of salvage assistance, loading of the vessel, etc.) (ref 13, p. 15,20)

"It is the current view of salvage experts in the United States that in nearly all grounding incidents a double bottom tanker will have a higher probability of ultimate survival and successful salvage than a single bottom tanker similar in all other respects." (U. S. paper on Double Bottoms submitted to February 1978 Conference on Tanker Safety and Pollution Prevention.)

b. Potential for fire or explosion in double bottom space.

Effect of DB on risk of fire/explosion is uncertain. See Ref 13, pg. 20-23 for discussion.

c. Impact of DB on safety of personnel entering DB spaces.

DB construction increases the number of spaces which will require inspection, cleaning, ventilation and maintenance, with attendant increased risks to personnel carrying out these tasks. Additional hazards will be introduced by the need to provide access and venting arrangements for DB tank spaces. (MSC/MEPC/INF. 15, page 9, by the United Kingdom).

d. Impact of DB on safety of personnel entering cargo tanks.

DB construction (with inner bottom framing in the DB) makes cargo tank cleaning and inspection much easier, faster, and less hazardous due to the absence of the internal framing normally found in the bottom of cargo tanks. DB construction thus increases safety of personnel entering cargo tanks.

4. No affect.

5. Impact of SBT/PL (new ships) on operational oil inputs.

SBT/PL (new ships) will have same impact on operational oil inputs as SBT discussed in item 9. below. If SBT/PL is arranged in DB it will have impacts discussed in 1. above.

6. Impact of SBT/PL (new ships) on accidental oil inputs.

The intent of requiring protective location of SBT is to selectively locate segregated ballast tanks in way of the cargo spaces to provide a measure of protection in case of grounding or collision. In assessing the impact of SBT/PL, pertinent questions are:

Table 6 (continued)

a. What constraints should be placed on the location of SBT?

b. What effect will these constraints have on tanker design?

c. What effect will these changes in tanker design have on accidental oil outflows resulting from collisions and groundings?

The February Conference will consider, as an alternative to double bottoms, the use of a formula specifying protected area of side and bottom shell as a function of total side and bottom shell area within the cargo tank length to constrain the location of segregated ballast tanks. The Conference must develop answers to the following questions:

What portion of the total shell area is to be protected? What minimum separation distance between the shell and tank to be protected should be specified for vessel side and bottom?

The United States believes that segregated ballast spaces should be distributed so that at least 45% of the total side and bottom shell area within the cargo tanks is protected and that protective spaces should separate the cargo tank boundaries from the shell plating of the vessels by at least 2 meters, whether the spaces are located on the side or bottom. These constraints would require that new tankers be built with double bottoms, double sides, staggered wing tanks (with wing bulkheads located further outboard then is usual today), or some combination of these. There is a difference of opinion among naval architects and ship designers concerning how to best utilize segregated ballast tanks as protective spaces. This difference of opinion is largely due to uncertainties over basic information on accident probability and severity, probable damage location along the ships length and around its girth, longitudinal and girth wise extend of damage, and penetration. With a given volume of segregated ballast spaces, there is a tradeoff between the total area to be protected and the depth of protection provided. A relatively small area can be protected against most hazards, including fire or explosion following a major collision, or a relatively large area can be protected against some hazards. Segregated ballast protective location arrangements which used double bottoms would affect a portion of the outflow from groundings. Segregated ballast protective locations which used staggered wings or double sides would affect a portion of outflow from both groundings and collisions depending on the area of the ship which was covered. The Coast Guard believes that segregated ballast spaces distributed so that at least 45% of the total side and bottom shell area are covered would be equally as effective in reducing accidental oil outflows in U. S. waters as would a requirement for double bottoms.

7. Impact of SBT/PL on Safety.

SBT/PL may avoid explosion or fire following a collision if the collision occurs in the way of a segregated ballast tank. This will not be the case if the segregated ballast is located in the double bottom or if the segregated ballast tank is not deep enough on the side to avoid penetration in the case of collision.

Table 6 (continued)

8. No effect.

9. Impact of SBT on operational oil inputs.

SBT reduces operational oil outflows by nearly eliminating oil/water mixtures created by ballasting of cargo tanks or tank cleaning to provide clean ballast. SBT does not reduce oil remainders, clingage, and sediment in cargo tanks. There is some indication that SBT may reduce the amount of sediment formation by reducing the amount of water washing of cargo tanks. SBT does not eliminate cargo tank washing for sludge and sediment removal.

10. Impact of SBT on accidental oil inputs.

SBT, when located against the shell of the ship, provides a defensive space which may reduce oil outflow in the event of collision or grounding. In case of collision or grounding to a loaded tanker, cargo might be transferred from a damaged tank to an empty segregated ballast tank to avoid loss of oil overboard, if some way of transferring can be found. SBT may result in the possibility of greater oil outflow in groundings as the result of probably greater freeboard of a segregated ballast tanker as compared to a conventional tanker.

11. Impact of SBT on safety.

SBT may reduce loss of life and property damage following collision if the collision occurs in the way of a segregated ballast tank rather than a cargo tank and fire or explosion does not result from the collision.

12. No effect.

13. Impact of CBT on operational oil inputs.

CBT has the same advantages for reducing operational pollution as claimed above for SBT.

14. Same as item 10. for SBT.

15. No effect.

16. No effect.

17. Impact of COW on operational oil inputs.

COW reduces oil remaining on board the ship when it leaves the discharge port, and therefore reduces the amount of oily mixtures created. COW gives, a large reduction in water washing, consequently, as large reduction in oil/water mixtures. COW may not be applicable to certain crude oils and is not applicable to black product and white product carriers.

Table 6 (continued)

18. COW has no affect on accidental pollution.

19. COW nearly eliminates manual tank cleaning operations, thus reducing risk to tank cleaning personnel.

20. COW may increase hydrocarbon emissions into the atmosphere unless steps are taken to control or eliminate such discharges. COW will reduce the need for oily waste reception facilities (See Section 3.3.3)

21. No effect.

22. Impact of IGS on accidental oil inputs.

    IGS may have some small impact on accidental oil inputs by avoiding oil outflow following fire and explosions.

23. Impact of IGS on safety.

    IGS is expected to have an important impact on safety. Risk of fire and explosion during tank washing and loading and discharge should be greatly reduced.

24. No effect.

25. No effect.

26. Impact of Radar and CAA on accidental oil inputs.

    Requirements for a second radar and CAA equipment would affect accidental oil inputs to the degree they reduce the probability of tanker grounding and collision accidents through the methods discussed in 27.

27. Impact of Radar and CAA on safety.

    Requirements for a second radar would provide greater reliability for source of radar information for collision avoidance and navigation functions. Primarily this would provide a "back up" in case of failure of the primary radar, but it would also improve the amount and quality of information available by permitting use of one X-band and one S-band device, or by having one radar set on long range for navigation use while the other is on short range for use in maneuvering, or one for use by the pilot and one for master/mate, etc. Better information would permit better performance of collision avoidance and navigation tasks and result in lower risk of collision or grounding.

    CAA would also provide better information for collision avoidance function, alerting the watchstander to collision threats, providing relief from manual plotting tasks, faster threat evaluation, and perhaps even safe maneuver information or results of a trial maneuver. Better information provided by CAA should result in more effective performance of collision avoidance function and lower risk of collision.

Table 6 (continued)

28. No effect.

29. No effect.

30. Impact of improvements to emergency steering on accidental oil inputs.

Improvements to emergency steering requirements could affect accidental oil inputs through avoiding oil outflow following a collision, ramming, or grounding accident resulting from steering failure. Accident records indicate that frequency of oil outflow as a result of steering failure is very low.

31. Impact of improvements to emergency steering on safety.

Improvements to emergency steering are expected to improve safety through helping to avoid collision, ramming and grounding accidents resulting from steering failures. The incidence of accidents resulting from steering failures is relatively low.

32. No effect.

33. Impact of inspection and certification requirements on operational oil inputs.

The primary impact of changes to international vessel inspection and certification requirements would be improved maintenance of equipment and systems to which new requirements would apply. Systems included which would have an impact on operational oil outflows are oily water separators, oil content monitoring and control systems, COW (if adopted as part of new Protocols), and pumproom. Improved maintenance should result in more effective LOT and COW and less oil in pumproom bilges.

34. Impact of inspection and certification requirements on accidental oil inputs.

Impact of changes to inspection and certification requirements on accidental oil inputs would be through reduction in probability of cargo transfer spills, fires and explosions resulting in oil outflow, and structural failures resulting in oil outflow. New inspection and certification requirements should result in better maintenance of cargo transfer piping systems and less risk of cargo transfer spills as a result of piping system failures. Impact on fires/explosions and structural failures is discussed in 35.

35. Impact of inspection and certification requirements on safety.

Changes to inspection and certification should lead to improved maintenance and material condition of cargo tank venting systems, cargo piping systems, pumproom ventilation systems, and electrical equipment in hazardous areas. These improvements should, in turn, result in reduced

Table 6 (continued)

risk of fire or explosion. Inspection and certification changes and resulting changes in structural examination procedures used by classification societies should also result in reduced probability of structural failures of tankers. Inspection and certification changes will also result in improved maintenance of navigation equipment and resulting reduction in probability of grounding accidents.

36. No effect.

Table 7

IMPACT OF VARIOUS MEASURES ON WORLDWIDE OIL INPUTS
NEAR TERM

Case or Protocol Alternative	Estimated Worldwide Oil Outflow (thousands of metric tons per year)
Baseline	3396
1969 Amendments to 1954 Convention	1079
MARPOL 73	861
U. S. Proposal (Table 3)	666
Package 1 (Table 4)	668
Package 2 (Table 5)	621-782

Notes:

1. Baseline case assumes no measures are taken to avoid operational oil outflows (no LOT/ROB, no use of reception facilities, all oily mixtures discharged to the sea).

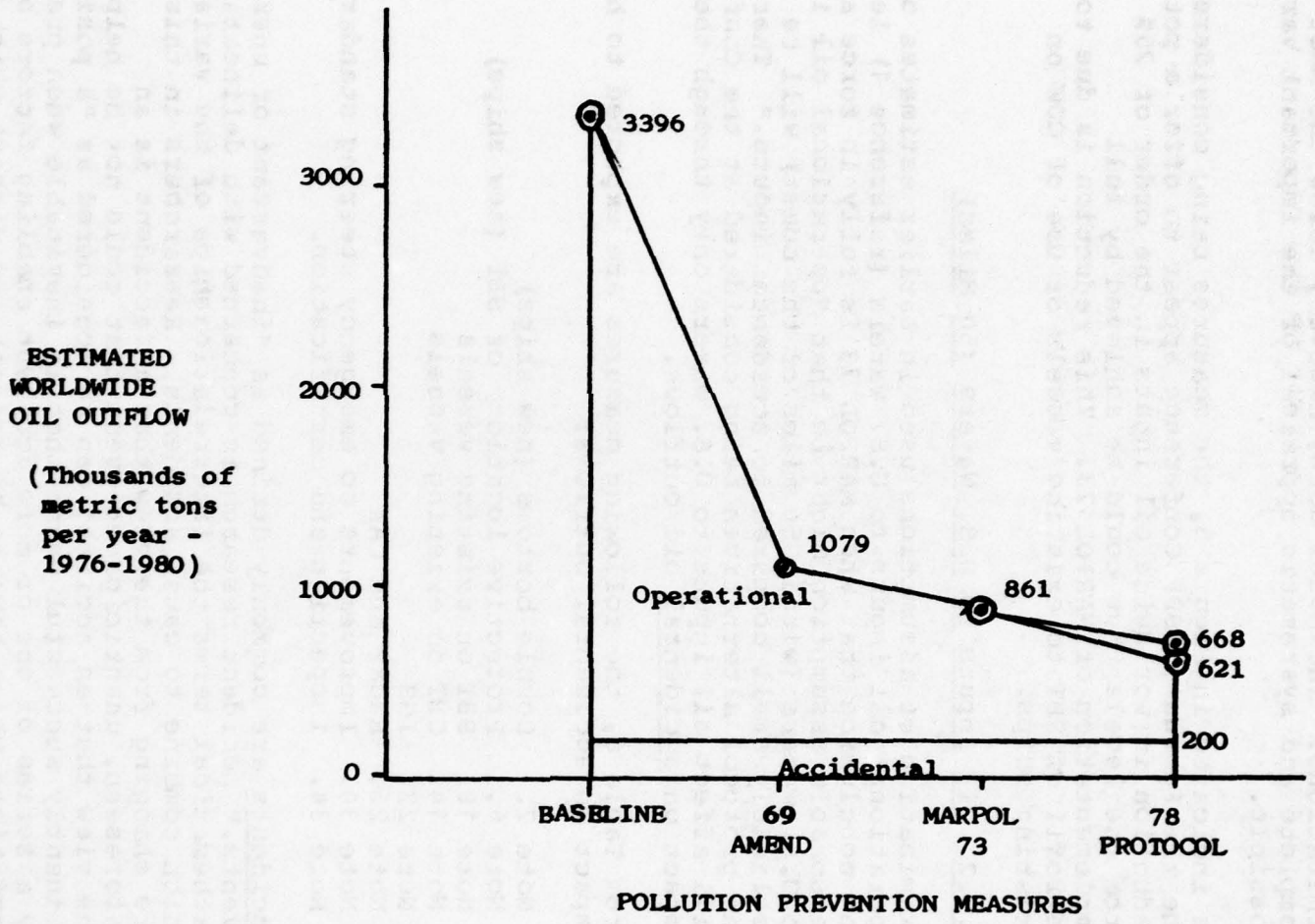
2. 1969 Amendments and MARPOL 73 assume agreements enter into force and all ships attempt to comply, some do reasonably well, and others do poorly.

3. Evaluation of Protocol Alternatives (U.S. Proposal, Package 1, and Package 2) based on near-term benefit due to SBT retrofit on existing ships or requirement for COW on existing ships as required by each "package".

4. Range of estimates for Package 2 results from range of input assumptions reflecting uncertainty over COW effectiveness and enforceability. For a discussion of these questions see Section 2.2.1.2.3 Crude Oil Washing.

Figure 5

WORLD OIL OUTFLOW MODEL RESULTS



limitations. The model does, however, allow the most complete and systematic appraisal of the important variables possible.

As indicated in Figure 5, the measures being considered at the the February TSPP Conference appear to offer a potential reduction in worldwide oil inputs in the order of 20% to 30% from the levels that could be achieved by full implementation of MARPOL 73. This reduction is due to retrofit of SBT to existing vessels or use of COW on existing ships.

3.3.2 Oil Inputs to U.S. Waters (50 Miles)

Examination of assumptions used in earlier estimates of operational oil inputs to U.S. waters (reference 1) lead to the conclusion that when MARPOL 73 is fully in force a reasonable assumption might be that "operational oil input to U.S. waters (within 50 miles of the coast) will be negligibly small compared to accidental inputs." Therefore the protocol alternatives being considered at the Conference will affect oil inputs to U.S. waters only through their impact on accidental oil outflows.

From Table 6, the following measures are expected to have an impact on accidental outflows:

Note 2. Double bottoms (new ships)
Note 6. Protective location of SBT (new ships)
Note 10. SBT on existing vessels
Note 14. CBT on existing vessels
Note 22. IGS
Note 26. Radar and CAA
Note 30. Improvements to emergency steering standards
Note 34. Inspection and certification.

Accidents are commonly defined as "inadvertant or unexpected events." Accident research is concerned with delineating in mathematical terms the interrelationships of the variables which combine to cause accidents. Researchers in this field are changing from the view that an accident is an unforeseen, unanticipated event that could not be helped, to the view that an accident can be considered as "a positive, eminently successful event that is inevitable when preceded by a series of one or more accident enabling factors or conditions which have to be present and without which the accident cannot occur." Today, however, in the case of tanker accidents we are still a long way from having

identified these accident enabling factors and the interrelationships among them.

This makes prediction of the effects of various measures on the probability of an occurrence of accidents a difficult and hazardous task. In addition, another problem lies in the nature of oil spill statistics. The great majority of accidental spills are small, but the very few large spills account for most of the volume of oil spilled. Statistics which add up and average out spills ignore this essential characteristic of oil spills, and thus tend to give an erroneous impression of the real risks involved. All of which, at this stage of development of our knowledge of tanker accident causal factors and accidental oil outflow results, tends to make prediction of the effect of various measures on future accidents and resulting oil outlfows a somewhat subjective and tentative thing.

At this point, the impact of accidental oil outflow in U.S. waters has been carried out only for double bottoms (on new ships) and for protective location (PL) of SBT (on new ships). (It is assumed the SBT/PL requirement would specify 45% area coverage.) It is estimated these two alternatives would have nearly an equal impact, offering potential for approximately a 50% reduction in the estimated annual oil input to U.S. waters from collision, ramming, and grounding accidents (reduction from 5,000 tons/year to 2,600 tons/year). This potential would, of course, be realized only as tankers with DB or SBT/PL entered service and ran aground or collided.

3.3.3 Air Pollution

Hydrocarbon vapors may be emitted to the atmosphere both during loading and unloading operations. None of the measures being considered will affect hydrocarbon emissions due to loading.

After unloading, tank vessels normally ballast by drawing water into selected cargo tanks and in doing so displace the hydrocarbon vapors in the tanks to the surrounding atmosphere. SBT and CBT provide separate compartments for water ballast which are not used to carry oil. This means that during ballasting there are no hydrocarbon vapors emitted which could contribute to the deterioration of air quality.

The effect of COW on hydrocarbon emissions is difficult to determine. At best it will offer no additional emissions

over that occuring from the ballasting of dirty cargo tanks. However, it may in fact cause additional emissions since the vapors remaining in a tank after crude oil washing may have a higher hydrocarbon vapor concentration than found in a tank which has only been emptied.

IGS will have little or no effect on air pollution. The only benefit would be that closed gauging is employed with IGS.

3.4 IMPACT OF PROTOCOL ALTERNATIVES ON SAFETY

Referring to the third column of Table 6, the following measures have been identified as having an impact on safety:

Note 3 - Double bottoms (new ships)
Note 7 - SBT/PL (new ships)
Note 11 - SBT
Note 19 - COW
Note 23 - IGS
Note 27 - Radar and CAA
Note 31 - Emergency steering
Note 35 - Inspection and Certification.

The notes to Table 6 referred to above indicate how these measures are expected to have an impact on safety. As discussed in section 3.3.2, quantifying the predicted impact of these measures on the incidence of accidents, deaths, injuries, and property damage is a difficult and somewhat subjective task. Of the measures listed, only the requirement of the U.S. proposal for IGS on additional tankers (all new and existing tankers over 20,000 DWT, except new tankers over 100,000 DWT and new combination carriers over 50,000 DWT on which SOLAS 74 already requires IGS) has been quantified, and there the estimated impact worldwide would be a reduction of the average number of fires and explosions by three per year and a resulting reduction in lives lost of 20/year. New inspection and certification requirements are also expected to have a significant impact on poor maintenance, which is believed to be a contributing factor in fires, explosions, and structural failures.

3.5 COST AND ECONOMIC IMPACTS

Cost for retrofit of the world tanker fleet (vessels of 20,000 DWT or more) to SBT is difficult to determine with accuracy because of assumptions which must be made. Several estimates of the cost of conversion of the world tanker

fleet have become available through the IMCO forum in addition to studies conducted in this country. Two studies were selected for this analysis because each covered the entire scope of retrofit and illustrates how differences in assumptions can affect expected costs. One of these studies was performed by a consultant Pierre Theobald for the French Government and is known as the Theobald Study, reference 19. Another study, known as the Organization for Economic Co-operation and Development (OECD) Study, was performed by a company of marine consultants (Micro Ltd.), reference 20.

Retrofit of SBT requires the following work to be done on a tanker which will vary from vessel to vessel:

a. Structural changes through the provision of additional bulkheads and possibly bottom strengthening.

b. Re-arrangement of piping and pumping.

c. Coating and corrosion protection for ballast tanks.

Some of the assumptions made with respect to the variables delineated above are:

a. Additional Bulkheads

The Theobald Study assumed that only one new bulkhead per side would be required per tanker. The OECD Study also found that one additional bulkhead would be the most representative assumption. This study also assumed that structural change is limited by vessel age. The assumption is that only vessels between 1-9 year old need additional bulkheads, while older vessels do not.

b. Piping and Pumping

The Theobald Study assumed that most tankers have available collector lines and pumps which could be dedicated to clean ballast, and that the piping alterations concern only the connections between the tanks and the main lines. The OECD Study made a similar assumption.

c. Protection of the Ballast Tanks

The Theobald Study assumed full coating for each ballast tank. The OECD Study assumed that the degree of corrosion control will be determined at the individual owner level and primarily by the age of the vessel in question. Specifically their assumptions were:

Vessels 1-9 years old - full tank coating.
Vessels 10-14 years old - full coating or 50% full coating (two cases).
Vessels 15 years or older - no coating.

Based on the above assumptions and analysis of the world tanker fleet, both studies derived estimates of the cost of conversion of the world tanker fleet to the segregated ballast optimum draft solution (SBT). The cost elements quantified are:

1. Conversion costs.

2. Cost of tanker cargo capacity lost due to SBT retrofit.

3. Bunker costs.

4. Off hire costs.

The resulting cost estimates for both studies are shown in table 8. The costs shown in this table represent the total conversion costs to the tanker owners. This cost varies between 3 to 7 billion dollars. The variation is probably due to the difference in the estimates of the number of tankers to be converted because the average costs per tanker resulting from the cost estimates are nearly the same (approximately $2 million). As shown in table 8, the OECD Study estimated that twice as many tankers would be converted than shown in the Theobald Study.

The unit costs shown in table 8 were used to estimate the conversion costs for U.S. tankers. These costs are shown in table 9. Note that since the number of tankers are identical, the cost estimates are very close to each other. A similar calculation was performed for an estimate of the number of foreign tankers entering U.S. waters. These estimates are shown in table 10. The total conversion costs for these tankers varies between 2.5 to 3 billion dollars.

The estimates in tables 9 and 10 were then combined in order to obtain a total conversion cost estimate for all tankers plying U.S. waters. These estimates are shown in table 11.

Using the total cost figures shown in tables 8 and 11, it can be estimated that the U.S. will bear between 44% to 93% of the total cost of conversion.

Table 8 WORLD TANKER FLEET COSTS

ITEM / STUDY	NUMBER OF TANKERS CONVERTED	TOTAL CONVERSION COSTS TANKER OWNERS (10^6)	AVERAGE COST PER TANKER (10^6)
THEOBALD	1594	3214	2.02
OECD	3326	7384	2.22

Table 9 US TANKER FLEET COSTS

ITEM / STUDY	NUMBER OF TANKERS CONVERTED	TOTAL CONVERSION COSTS TANKER OWNERS (10^6)
THEOBALD	231	467
OECD	231	512

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Table 10 FOREIGN TANKERS IN US TRADE

ITEM / STUDY	NUMBER OF TANKERS CONVERTED	TOTAL CONVERSION COSTS TANKER OWNERS (10^6)
THEOBALD	1250	2525
OECD	1250	2775

Table 11 US AND FOREIGN TANKERS IN US OIL TRADE

ITEM / STUDY	NUMBER OF TANKERS CONVERTED	TOTAL CONVERSION COSTS TANKER OWNERS (10^6)
THEOBALD	1481	2992
OECD	1481	3288

The Theobold Study estimates that the cost of conversion would generate an increase in cost per ton of crude oil of $0.30. This would amount to about 0.1 cent per gallon of crude oil.

The additional cost for the addition of a double bottom in a new tanker is estimated to vary from 8% to 12% of the cost of a new segregated-ballast tanker.

The estimated cost for installation of an IGS is $1.0 million per vessel. The overall cost to the world fleet would be approximately $3.5 billion, with the cost to U.S. vessels approximately $250 million. The cost of operation, maintenance, and replacement of system components for the IGS and the following systems are not considered significant in the cost impact.

The average cost of a second radar system is $30,000 and that of a CAA device is $120,000. The overall total cost would be approximately $450 million for applicable worldwide vessels (10,000 gross tons or more) with the cost to U.S. vessels being $37.5 million and foreign vessels being $412.5 million.

The back-up steering gear systems with the failure alarm will cost approximately $10,000 per vessel for a total of $30 million for the applicable vessels worldwide. The cost to U.S. vessels would be $2.5 million, while the cost to foreign vessels would be $27.5 million.

3.6 TECHNICAL FEASIBILITY

The Coast Guard considers requirements for retrofitting of segregated ballast on existing tank vessels and for double bottoms and segregated ballast on new tank vessels to be technically feasible. A study submitted to IMCO by Norway, Greece, and Italy (reference 8) examined options for providing segregated ballast on existing vessels. The necessary alterations to a vessel's cargo system and ballast system piping and pumps are estimated to take four to six weeks of shipyard time. An estimated additional two to four weeks may be necessary if tank bulkheads must be altered or relocated.

A number of double bottom tankers have been built in recent years and are in operation, indicating the technical feasibility of double bottoms. (Reference (4), pages 39-41 show 34 tankers with double bottoms or double hulls were in

operation, under construction, or contracted for in January, 1975.)

The requirements for Inert Gas System, a second radar, collision avoidance assistance equipment and a backup steering gear control system are also considered to be technically feasible.

Current Federal regulations require all tank vessels of 100,000 DWT or more and each combination carrier of 50,000 DWT or more to be equipped with an IGS. The system has already been installed on new tank vessels and combination carriers and retrofitted on existing tank vessels and combination carriers. Installation of IGS is perhaps most complex on product carriers because of the requirement to prevent accidental mixing of cargoes through IGS piping. To date there are approximately 450 vessels equipped with IGS attesting to the technical feasibility of the system and its installation.

More than 80% of the tank vessels of 10,000 gross tons or more have been equipped with a second radar system when the vessel was initially constructed or retrofitted with it at some time after construction. Of these vessels it is estimated that over 600 vessels are equipped with or have ordered CAA equipment. Based on this previous experience, the Coast Guard considers a second radar system and CAA equipment technically feasible.

All follow-up steering gear systems employ a control system as the linkage mechanism between the signal input and steering gear power system. This indicates that the equipment design concept is technically feasible. For vessels where the installation of the equipment is not technically feasible due to the complication of the system, the U.S. proposal offers manning of the steering space as an alternative. The Coast Guard estimates that approximately 55% of the vessels to which this requirement is applicable have back-up steering gear control systems installed at the present time.

4. ALTERNATIVES TO THE PROPOSED ACTION

The only alternative to U.S. participation in the International Conference on Tanker Safety and Pollution Prevention is no U.S. participation. Since the Conference is being held in response to the U.S. proposal that a Conference be convened, and the Conference represents a significant opportunity to improve international tanker safety and pollution prevention, the alternative of not participating would make little sense and is discarded as not serving U.S. interests.

Given that the U.S. will participate, the main objective of U.S. participation should be to reach agreement on changes to MARPOL 73 and SOLAS 74 along the lines suggested by the U.S. proposals, or at least in some fashion which produces similar benefits in terms of improved safety and environmental protection. Once the Conference is completed and specifics of the proposed changes to international requirements are known, an assessment of the potential impacts of these changes can be made and a decision reached whether the U.S. should adopt these changes and ratify the Protocols developed at the Conference, or proceed on some other course of action.

5. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED.

The overall effect of these proposals would be to reduce the amount of oil entering the oceans as indicated in Section 3. No adverse environmental effects are anticipated as a result of this action.

6. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

So far as the Coast Guard can determine, these proposed actions do not involve any tradeoffs between short-term and long-term environmental gains and losses, nor does the proposed action foreclose any future options.

7. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No irreversible and irretrievable commitments of resources are involved in this proposed action.

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APPENDIX A

1. "Oil Pollution of the Oceans; The President's Message to the Congress Recommending Measures to Control the Problem," Dated March 17, 1977. Released March 18, 1977. Weekly Compilation of Presidential Documents, Volume 13, Number 12, March 21, 1977, pages 408-409.

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Oil Pollution of the Oceans

The President's Message to the Congress Recommending Measures To Control the Problem. Dated March 17, 1977. Released March 18, 1977

To the Congress of the United States:

The recent series of oil tanker accidents in and near American waters is a grave reminder of the risks associated with marine transportation of oil. Though we can never entirely eliminate these risks, we can reduce them. Today I am announcing a diverse but interrelated group of measures designed to do so.

These measures are both international and domestic. Pollution of the oceans by oil is a global problem requiring global solutions. I intend to communicate directly with the leaders of a number of major maritime nations to solicit their support for international action. Oil pollution is also a serious domestic problem requiring prompt and effective action by the federal government to reduce the danger to American lives, the American economy, and American beaches and shorelines, and the steps I am taking will do this.

The following measures are designed to achieve three objectives: First, to reduce oil pollution caused by tanker accidents and by routine operational discharges from all vessels; Second, to improve our ability to deal swiftly and effectively with oil spills when they do occur; and Third, to provide full and dependable compensation to victims of oil pollution damage.

These are the measures I recommend:

• RATIFICATION of the International Convention for the Prevention of Pollution from Ships. I am transmitting this far-reaching and comprehensive treaty to the Senate for its advice and consent. This Convention, by imposing segregated ballast requirements for new large oil tankers and placing stringent controls on all oil discharges from ships, represents an important multilateral step toward reducing the risk of marine oil pollution. In the near future, I will submit implementing legislation to the Congress.

• REFORM of ship construction and equipment standards. I am instructing the Secretary of Transportation to develop new rules for oil tanker standards within 60 days. These regulations will apply to all oil tankers over 20,000 deadweight tons, U.S. and foreign, which call at American ports. These regulations will include:

—Double bottoms on all new tankers;

—Segregated ballast on all tankers;

—Inert gas systems on all tankers;

—Backup radar systems, including collision avoidance equipment, on all tankers; and

—Improved emergency steering standards for all tankers.

These requirements will be fully effective within five years. Where technological improvements and alternatives can be shown to achieve the same degree of protection against pollution, the rules will allow their use.

Experience has shown that ship construction and equipment standards are effective only if backed by a strong enforcement program. Because the quality of inspections by some nations falls short of U.S. practice, I have instructed the Department of State and the Coast Guard to begin diplomatic efforts to improve the present international system of inspection and certification. In addition, I recommend the immediate scheduling of a special international conference for late 1977 to consider these construction and inspection measures.

• IMPROVEMENT of crew standards and training. I am instructing the Secretary of Transportation to take immediate steps to raise the licensing and qualification standards for American crews.

The international requirements for crew qualifications, which are far from strict, will be dealt with by a major international conference we will participate in next year. I am instructing the Secretary of Transportation to identify additional requirements which should be discussed, and if not included, may be imposed by the United States after 1978 on the crews of all ships calling at American ports.

• DEVELOPMENT of Tanker Boarding Program and U.S. Marine Safety Information System. Starting immediately, the Coast Guard will board and examine each foreign flag tanker calling at American ports at least once a year and more often if necessary. This examination will insure that the ship meets all safety and environmental protection regulations. Those ships which fail to do so may be denied access to U.S. ports or, in some cases, denied the right to leave until the deficiencies have been corrected. The information gathered by this boarding program will permit the Coast Guard to identify individual tankers having histories of poor maintenance, accidents, and pollution violations. We will also require that the names of tanker owners, major stockholders, and changes in vessel names be disclosed and included in this Marine Safety Information System.

• APPROVAL of Comprehensive Oil Pollution Liability and Compensation Legislation. I am transmitting appropriate legislation to establish a single, national standard of strict liability for oil spills. This legislation is designed to replace the present fragmented, overlapping systems of federal and state liability laws and compensation funds. It will also create a $200 million fund to clean up oil spills and compensate victims for oil pollution damages.

• IMPROVEMENT of federal ability to respond to oil pollution emergencies. I have directed the appropriate federal agencies, particularly the Coast Guard and the Environmental Protection Agency, in cooperation with

state and local governments to improve our ability to contain and minimize the damaging effects of oil spills. The goal is an ability to respond within six hours to a spill of 100,000 tons.

Oil pollution of the oceans is a serious problem that calls for concentrated, energetic, and prompt attention. I believe these measures constitute an effective program to control it. My Administration pledges its best efforts, in cooperation with the international community, the Congress, and the public, to preserve the earth's oceans and their resources.

JIMMY CARTER

The White House,
March 17, 1977.

EMBARGOED FOR USE AFTER BRIEFING MARCH 16, 1977

Office of the White House Press Secretary

THE WHITE HOUSE

FACT SHEET
ACTIONS TO REDUCE MARITIME OIL POLLUTION

The President is considering a series of possible Federal Government actions to deal with the problem of marine oil pollution caused by oil tankers. These include:

-- U. S. ratification of the International Convention for the Prevention of Pollution from Ships, 1973.

-- Regulatory action by the Department of Transportation to establish new U. S. standards for all tankers entering U. S. ports.

-- Submission to Congress of oil spill liability and compensation legislation.

-- The establishment of a U. S. Marine Safety Information System to identify tankers with long histories of poor maintenance, accidents and pollution violations.

BACKGROUND

The rash of oil tanker accidents which occurred this winter off our east and west coasts has brought home to us the serious risks which are involved in marine transportation of oil. Oil pollution threatens some of our most valuable natural resources -- the ocean, its living inhabitants, our beaches and our shorelines. Oil tanker accidents also endanger human lives, and oil pollution can jeopardize the economic security of millions of Americans who live in coastal communities.

In his Address to the Nation on February 2, the President recognized these risks and the need for timely government action to deal with the problem. In response to the President's concern, the Director of the Office of Management and Budget established an interagency Task Force to identify possible solutions.

The Task Force recommended to the President that he also consider action to reduce marine oil pollution caused by operational discharges from tankers. The Argo Merchant, the Sansinena and the Olympic Games have been the subject of much public concern. Such tanker groundings and collisions are a serious problem to the localities where they occur. However, they are not the major maritime source of ocean oil pollution. Operational discharges from oil tankers and other vessels cause a far greater total amount of oil pollution than accidents. Therefore, the actions which the President is considering deal with both problems.

THE INTERAGENCY OIL POLLUTION TASK FORCE

The Task Force was formed on February 3. The Office of Management and Budget chaired the group. The following agencies participated:

Department of State
Department of the Treasury
Department of Defense

more

Department of Justice
Department of the Interior
Department of Commerce
Department of Transportation
Federal Maritime Commission
Environmental Protection Agency
Council on Environmental Quality
Federal Energy Administration

Subgroups developed proposed initiatives in five areas:

1. Ships and ship systems
2. Crew standards and training
3. Oil pollution liability and compensation
4. International conventions
5. Oil spill response.

The Task Force contacted representatives of more than twenty interested public organizations and several States to solicit their views and suggestions. The organizations included environmental groups, the oil and transportation industries, oil spill cleanup companies and maritime unions. The States included Alaska, California, Florida, Louisiana, Maine, Massachusetts, Oregon and Washington. The suggestions and views of all of these groups are being carefully considered.

OBJECTIVES

The President's program is designed to meet four objectives:

1. reduce oil pollution resulting from oil tanker accidents and operational discharges;

2. improve our ability to deal with oil spills when they do occur;

3. assure that any citizens damaged by oil spills are fully compensated for their losses; and

4. reorganize Federal oil pollution programs to make them simpler and more responsive.

APPROACH

Pollution of the oceans by oil is a global problem. The United States is an active participant in the Inter-Governmental Maritime Consultative Organization, an international forum sponsored by the United Nations to formulate programs to reduce vessel pollution and to ensure safety of human life and vessels. The President's international initiatives will involve working through this international agency, as well as bilateral discussions with major shipping nations, our trading partners and our neighbors. The President plans to communicate directly with the leaders of a number of major maritime nations to seek their support in this effort.

On the domestic front, the President is considering strong administrative actions to upgrade U. S. standards on all oil tankers entering U. S. ports, as well as on the crews manning them. He is also considering action to upgrade several Federal programs designed to prevent accidents and respond to spills, including Coast Guard's tanker examination program and information systems and Federal oil spill response capability.

White House staff and the Office of Management and Budget spent yesterday on Capitol Hill discussing possible solutions with Members of Congress with a special interest in this area and with their staffs. That process is continuing. We hope to have their recommendations incorporated into a final proposal to be announced on Friday.

# # #

MARCH 18, 1977

Office of the White House Press Secretary

THE WHITE HOUSE
FACT SHEET

Actions to Reduce Maritime Oil Protection

The President today announced a series of recommended Federal Government actions to deal with the problem of marine oil pollution caused by oil tankers. These include:

- A call for a special international conference to discuss stricter standards for oil tanker construction, equipment and inspections.
- Regulatory action by the Department of Transportation to establish new U.S. standards for all tankers entering U.S. ports.
- A Coast Guard program to board and examine all foreign flag oil tankers entering U.S. ports.
- U.S. ratification of the International Convention for the Prevention of Pollution from Ships, 1973.

BACKGROUND

As announced on March 16, these measures are designed to deal with the problem of oil tanker accidents and spills which occurred so frequently in and near U.S. waters this winter. The recommended actions will also serve to reduce oil pollution caused by operational discharges from tankers.

The President plans to communicate directly with the leaders of a number of major maritime nations to seek their support for strengthened international solutions to this world-wide environmental problem. The United States will also continue to participate actively in the Inter-Governmental Maritime Consultative Organization, a special United Nations agency, to formulate new programs to reduce vessel-source oil pollution.

The President's domestic program is strong and comprehensive. It includes both administrative and legislative actions and meets all four of the President's objectives - reduction in tanker pollution, improvements in oil spill response, assuring compensation of damaged citizens, and reorganization of government programs.

The recommended actions were formulated after consultation with environmental groups, the oil and transportation industries, oil spill cleanup companies and maritime unions. In addition, the suggestions and views of coastal States were solicited.

THE PRESIDENT'S PROPOSALS

1. The International Convention for the Prevention of Pollution from Ships, 1973

   The President will transmit this important International Convention to the Senate for its advice and consent and will submit implementing legislation next month for Congressional approval. The United States was a leader in the development of this Convention, commonly known as the 1973 Marine Pollution Convention. It is a far-reaching and comprehensive agreement which will have an important impact on marine oil pollution.

   The Convention places stringent controls on oil discharges from ships, including for the first time, discharges of light refined petroleum products. It requires segregated ballast

(OVER)

for all new tankers 70,000 deadweight tons and over, as well as oil discharge monitoring and control equipment, and sets requirements for cargo tank size and arrangement to limit oil spills in case of accident. In addition, the ports of signatories to the Convention will be required to have reception facilities for tankers' oily wastes.

2. Ship Construction and Equipment Standards

The President is directing the Secretary of Transportation to issue within 60 days proposed rules for a series of new oil tanker standards, and, as provided by law, to expedite the necessary regulatory procedures. The proposed regulations will apply to all oil tankers, U.S. and foreign, over 20,000 deadweight tons entering U.S. ports. They will include:

1. Double bottoms on all new tankers.

2. Segregated ballast on all tankers.

3. Inert gas systems on all crude tankers.

4. Backup radar systems with collision avoidance equipment on all tankers.

5. Improved emergency steering standards for all tankers.

These requirements would take full effect within five years. The rules should allow the adoption of technological improvements and alternatives which can be shown to accomplish equivalent pollution protection.

The President especially acknowledges the leadership of Senator Warren G. Magnuson and the Senate Commerce Committee on matters relating to tanker safety. All of the initiatives outlined above are the kinds of solutions the Committee has endorsed over a period of years.

Ship construction and equipment standards are not effective unless coupled with a strong enforcement program. Therefore, the President is directing the Department of State and the Coast Guard to begin diplomatic efforts to upgrade the present international system of inspection and certification. Construction and equipment inspections are carried out by all maritime nations. However, the quality of inspections by some nations falls far below U.S. practice.

In addition the United States will propose the immediate scheduling of a special international conference for the early fall to consider these construction and inspection measures. The U.S. will recommend that technical preparatory work be done by the Inter-Governmental Maritime Consultative Organization this spring and summer to ensure effective international action.

Authority for the domestic action is provided by the Ports and Waterways Safety Act of 1972 (Public Law 92-340) which provides the Department with a broad mandate to protect U.S. waters against pollution. These standards will reduce pollution through both accident prevention and reduction in operational discharges. A description of these requirements follows:

Double bottoms reduce oil spills caused by tanker groundings. Studies of groundings conclude that in 45 to 90 percent of cases no oil outflow would have occurred if the tank vessel had had a double bottom. The requirement will apply only to new vessels. Double bottoms can also be used for a part of the required segregated ballast space.

Segregated ballast provides tanks dedicated exclusively for the seawater which is carried by empty oil tankers for ballast. The use of separate clean tanks means that no oil is discharged along with ballast water. Deballasting and associated tank washing is the major source of operational oil pollution from tankers. Ballast tanks on new tankers can also be arranged to provide protection against oil outflow in case of accident.

The 1973 Marine Pollution Convention marks the international community's acceptance of the concept of segregated ballast. Coast Guard regulations currently require the system on all new tankers over 70,000 deadweight tons, foreign and domestic. The rulemaking proposed today also covers existing tankers. These vessels can achieve segregated ballast capability by dedicating certain cargo tanks to ballast and modifying piping and pumps.

Inert gas systems reduce the danger of explosions which may occur at times when oil tanks are not full, primarily during tank washing, but also in loading and unloading, and during ballast voyage. The Sansinena, which exploded in Los Angeles harbor in December while taking on ballast, had no inert gas system.

Current U.S. regulations require the system for new U.S. tankers over 100,000 deadweight tons. The proposed rule will also apply to existing tankers and foreign flag vessels.

Backup radar systems provide redundant capacity in case of equipment failure. Collision avoidance equipment can be programmed to automatically process radar information and to trigger an alarm when dangerous situations arise. The equipment also provides information to the crew for maneuvering to avoid the potential danger. The systems are most effective in the coastal confluence zone where vessel traffic patterns converge toward U.S. ports. The requirement will apply to both new and existing vessels and would be effective for existing vessels within 2 years of final rulemaking.

Improved emergency steering standards will be drafted. Current regulations impose redundancy requirements for some components of tanker steering gear. Additional requirements which would further improve reliability have been identified.

3. Crew Standards and Training

The President is ordering several actions to improve the qualifications of crews that man oil tankers entering our ports. These actions are particularly crucial because human error is involved in 80-85 percent of all tanker accidents. The United States imposes relatively strict standards for the U.S. Merchant Marine, but stringent international requirements for crew qualifications do not exist. However, the Inter-Governmental Maritime Consultative Organization is developing a major draft convention on the subject for negotiation next year. The President views this effort as a major international opportunity to upgrade crew qualifications. The President is directing the Departments of Transportation and Commerce to review the agenda (the draft convention) for the 1978 Conference on Standards of Watchkeeping and Training to identify additional requirements which should be proposed for consideration. In addition, the Department will identify all requirements which, if not included in the 1978 Convention, the U.S. should impose on crews of all ships entering U.S. ports.

Nationally, the President is directing Transportation to take immediate regulatory action to improve standards for U.S. crews. Requirements will include experience by class and size of vessel, or training and demonstration of proficiency on ship simulators. These requirements will apply to both issuance and renewal of licenses to ships masters, mates and Federally licensed pilots. More emphasis will be placed on requiring deck officers to demonstrate important skills, such as radar operation and interpretation, instead of relying on written examinations. Finally, regulations will be issued to require that crew members in charge of cargo transfer operations be specially trained and examined.

4. Tanker Boarding Program and U.S. Marine Safety Information System

The President is directing that, starting immediately, each foreign flag tanker which enters U.S. ports will be boarded by the Coast Guard and examined to insure that the ship meets all safety and environmental protection regulations. Tankers will be boarded at least once a year and more often if necessary. Any deficiencies in the tanker's condition will be required to be corrected. This winter the Coast Guard began a limited foreign tanker boarding program. The President's revisions to the Budget for the next fiscal year requested additional funding for this program.

The information which is gathered from the boarding program will be fed into a U.S. Marine Safety Information System, which will be established to keep track of the accident and pollution records of all ships, U.S. and foreign, entering U.S. ports. Coast Guard information systems already contain some of this information for U.S. vessels. Since 94% of our imported oil enters the country in foreign tankers, it is important that information on these vessels also be available to Captains of the Port at all major U.S. ports. The President is also directing that the proper Federal agencies initiate action to require that the names of tanker owners, major stockholders, and changes in vessel names be disclosed and be made available for inclusion in the Marine Safety Information System. This system will enable the Coast Guard to promptly identify tankers which have long histories of poor maintenance, pollution violations and accidents. Once identified, such tankers can be excluded from U.S. ports, if necessary.

5. Comprehensive Oil Pollution Liability and Compensation Legislation

The Secretary of Transportation will submit to Congress on the President's behalf the Comprehensive Oil Pollution Liability and Compensation Act of 1977, which replaces the current fragmented and overlapping systems of Federal and State oil spill liability laws and compensation funds with a single nationwide framework. It establishes one national standard of strict liability for oil spills whether the source be vessels, pipelines, terminals or offshore facilities. It also establishes a $200 million fund to cover cleanup costs and to assure full compensation to victims for virtually all oil pollution damages. The fund consolidates three existing Federal oil pollution compensation funds, the Trans-Alaska Pipeline Fund, the Deepwater Ports Fund and part of the Federal Water Pollution Control Act Fund. The compensation provided under the legislation is extensive. For example, eligible claimants include fishermen whose usual fishing grounds are polluted and resort communities whose peak vacation seasons are ruined by oil-slicked beaches.

The Administration bill is based on legislation which has been introduced by Congressmen Murphy and Biaggi and is now under consideration by the House Merchant Marine and Fisheries Committee. The Administration bill raises the minimum liability for vessels carrying oil in bulk to $500,000 and removes the $30 million ceiling on liability for supertankers. It also proposes a mechanism for States to participate in the Federal compensation system. Another change will allow the Fund to provide compensation to Federal and State agencies which perform post-spill environmental damage assessments.

6. Federal Oil Pollution Response Capability

The President is directing the Coast Guard, the Environmental Protection Agency, and other responsible Federal agencies to begin plans for upgrading their capability to respond to, contain,

and mitigate the damaging effects of oil spills in cooperation with State and local governments. Special attention will be given to spills which occur under extreme weather conditions.

The framework for coordination of Federal pollution response activities is established by the National Contingency Plan (40 Federal Regulations 1510). The Coast Guard and the Environmental Protection Agency are the lead agencies under the plan. In their assigned areas of responsibility, each agency predesignates Federal on-scene coordinators who are responsible for directing the Federal response when oil spills occur. The National Plan is supplemented by Regional Response Plans, which provide for coordination of Federal, State and local government response efforts. This response system, particularly the Regional Plans, will be reviewed as part of the President's oil pollution program.

Presently the Coast Guard can deliver pollution containment and cleanup equipment to the scene of a spill within 24 hours. The Administration plans to evaluate the costs and feasibility of upgrading this capability to provide adequate response within six hours for a spill of up to 100,000 tons of oil.

ADDITIONAL INITIATIVES

Along with the major actions just discussed, the President is directing the Secretary of Transportation, in cooperation with the Environmental Protection Agency and other appropriate agencies, to undertake several studies of other promising programs and techniques for reducing marine oil pollution. These studies will include:

- An evaluation of the costs and benefits of crude washing, a system which utilizes crude oil to clean cargo tanks.
- An evaluation of design, construction and equipment standards for tank barges which carry oil.
- A study of long range vessel surveillance and control systems.
- An evaluation of devices to improve maneuvering and stopping ability of large tankers, with research to include the use of ship simulator.
- A study of the fee collection mechanism for the comprehensive oil pollution fund.

The Secretary of Transportation will report back to the President after 6 months on the status of these studies.

# # #

APPENDIX 11

U. S. COAST GUARD IMPLEMENTATION OF PRESIDENTIAL INITIATIVE FOR EVALUATION OF COSTS AND BENIFITS OF CRUDE OIL WASHING

1 MAY 1978

Executive Summary

Crude oil washing (COW), a technique which utilizes crude oil to clean cargo tanks of tankers, has been developed over the last several years into a presently accepted alternative to segregated ballast tanks (SBT) for existing tankers. In addition, it has become an international requirement for all new tankers.

As a result of the "Presidential Initiatives" outlined in "Oil Pollution of the Oceans; the President's Message to the Congress Recommending Measures to Control the Problems," dated March 17, 1977, the Coast Guard embarked upon a program, both nationally and internationally, to develop new rules for oil tankers. In addition to the major actions proposed by the President, the Department of Transportation was directed to undertake several studies of other promising programs and techniques for reducing marine oil pollution. The particular study "An evaluation of the costs and benefits of crude washing, a system which utilizes crude oil to clean tanks," is the subject matter for this report.

In less than a year's time, COW has been developed from a tank cleaning procedure practiced by a few major oil companies to an internationally accepted method of reducing operational pollution. The U. S. and other nations started with very little detailed information on COW and through numerous national and international meetings/discussions developed detailed specifications and requirements for its use. Most of the deliberations were under the auspices of the Intergovernmental Maritime Consultative Organization (IMCO).

The study indicates that there are economic advantages to COW. These result from an increase in cargo outturn as well as reduced tank cleaning time prior to entry into a shipyard. Cost data comparing COW with segregated ballast tanks (SBT) retrofit are also discussed in this study. In addition to the cost data, the study reviews the advantages and disadvantages of COW.

The Coast Guard will implement regulations and procedures for crude oil washing in the following manner:

1. Regulatory - A "Notice" was published on 20 April 1978. This document sets forth our intentions with respect to the implementation of the International Conference on Tanker Safety and Pollution Prevention, 1978 (TSPP) Protocols.

2. Changes to the Marine Safety Manual (CG-495) will be incorporated to adequately cover crude oil procedures in general and COW in detail.

3. The instruction program for Coast Guard inspection personnel (Marine Safety School) will be updated to include instructions on COW procedures.

4. COW guidelines will be disseminated to the Coast Guard field merchant marine technical branches (mmt) which handle plan review for ship construction.

5. Guidelines will be provided to the Coast Guard field inspection units with respect to the tests prescribed in 4.2.10 of the specifications for the Design, Operation, and Control of Crude Oil Washing Systems (TSPP Resolution 15, Annex I).

In addition to the 5 items enumerated above, the Coast Guard is planning on sending an inspection team to the Port of Rotterdam. The purpose would be to obtain the benefit of the Netherland's expertise and experiences in the proper control and coordination of the practice of crude oil washing. Of particular interest will be the amount of coordination necessary between the ship's crew and the port authority.

COW normally will be conducted in-port, before the ship leaves it final port of discharge, under the close supervision, control and oversight of the Administration whose port the vessel is utilizing. However, if a tank is crude oil washed at sea between multiple discharge ports, the tank shall be left empty and available for inspection at the next discharge port before commencing the next ballast voyage.

Crude Oil Washing is a viable process. The economics of crude oil washing are proven and COW is an acceptable alternative to SBT from an operational pollution standpoint for existing vessels. Because COW is operational, certain precautions must be observed to insure that COW is being conducted in the most effective and safe way possible. It is felt that if the "Specifications" as developed by the TSPP Conference are adhered to, then COW will be a safe and effective way to reduce operational pollution as well as to economically clean tanks.

This study was prepared for the President in direct response to his "Presidential Initiatives" of March 1977.

TABLE OF CONTENTS

1.0 OBJECTIVE

2.0 BACKGROUND

3.0 SCOPE OF STUDY

4.0 STUDY RESULTS

4.1 Crude Oil Washing (COW)

4.1.1 Advantages

4.1.2 Disadvantages

4.2 International Development

4.3 Economics Evaluation

4.3.1 MarAd Study

a. Economic Advantage:

b. Retrofit costs:

4.3.2 Exxon Study

a. Economic Advantage;

b. Retrofit costs:

4.3.3 Netherlands Study

4.4 Follow-up

5.0 CONCLUSIONS

6.0 BIBLIOGRAPHY

CRUDE OIL WASHING

1.0 OBJECTIVE

The objective of this study is to evaluate the economics of crude oil washing (COW) and to develop proper safety criteria for permitting crude oil washing in U. S. ports. In addition, the results will assist the Coast Guard in determining whether crude oil washing is an acceptable alternative to segregated ballast on existing ships for purposes of reducing operational pollution.

2.0 BACKGROUND

In conjunction with the "Presidential Initiatives", announced by President Carter in his March 17, 1977, message to the Congress recommending measures to control the problem of oil pollution of the oceans, the following statement was made:

"ADDITIONAL INITIATIVES

Along with the major actions just discussed, the President is directing the Secretary of Transportation, in cooperation with the Environmental Protection Agency and other appropriate agencies, to undertake several studies of other promising programs and techniques for reducing marine oil pollution. These studies will include:

- An evaluation of the costs and benefits of crude washing, a system which utilizes crude oil to clean cargo tanks."

3.0 SCOPE OF STUDY

The basic premise essential to this study is that crude oil washing is a usable process. What will be examined are the technical merits of crude oil washing and how the Coast Guard can safely implement regulations and procedures for COW.

Only the direct aspects of crude oil washing need be evaluated. Current industry practice recommends crude oil washing be done only with ships fitted with fixed inert gas systems. The protocols developed at the February Conference on Tanker Safety and Pollution Prevention mandate fitting of fixed inert gas systems when COW is fitted.

What needs to be included is as follows:

(1) Requirements for personnel qualifications/training.

(2) Equipment parameters

(a) Required number and positioning of washing machines

(b) Required cargo pumping capabilities (wash and discharge cargo simultaneously)

(c) Adequacy of stripping system

(3) Verification that crude oil washing works

(a) System checks

(b) Duration of washing required

The three (3) basic areas, listed above, require indepth analyses.

4.0 STUDY RESULTS

4.1 Crude Oil Washing (COW)

Tank cleaning is the process of removing foreign matter, residual cargo, and water from tanks. Cleaning, performed as infrequently as possible, is accomplished for the following reasons:

a. In preparation for a Coast Guard biennial internal inspection.

b. In preparation for proceeding to a repair yard.

c. In preparation for a change in cargo (or prior to carrying another load of the same cargo).

d. For removal of excessive foreign matter from tank bottoms (sludge, wax, sand, etc.) to increase cargo carrying capacity.

The industry has continually looked for ways to reduce the contact between oil and water. The mechanical agitation of oil and water during water washing and transfer of residues to the slop tank forms oil-water emulsions that are difficult to separate.

The concept of waterless washing of cargo tanks is not a new one, but it took the development of large tankers of the VLCC (very large crude carrier) class to revive the concept on a practical basis. Most large tankers are equipped with large capacity, permanently mounted tank washing machines, and inert gas systems. With some piping modifications, it was relatively simple to convert to oil washing from water washing. Reduction of the significant amounts of oil/water mixtures involved was an added incentive to improve the pollution prevention capabilities of tankers.

Crude oil washing is a tank cleaning procedure that has been developed for certain oil tankers. The cleaning procedure is very similar to that

followed when cleaning with water with two notable exceptions. First, crude oil cargo is used as the washing medium rather than water. Second, the tank cleaning procedure normally is carried out while the vessel is discharging cargo in port rather than at sea.

During crude oil washing, a part of the cargo being discharged ashore is diverted through the fixed tank cleaning system into the tanks being emptied so that the exposed tank surfaces are washed by jets of crude oil. Any oil or sludge clinging to internal surfaces, and in particular horizontal surfaces, is washed down leaving the tanks' structure clean so that a minimum amount of water washing is required for the tank to be used for clean ballast, or gas-freed for man-entry or to carry-out repairs.

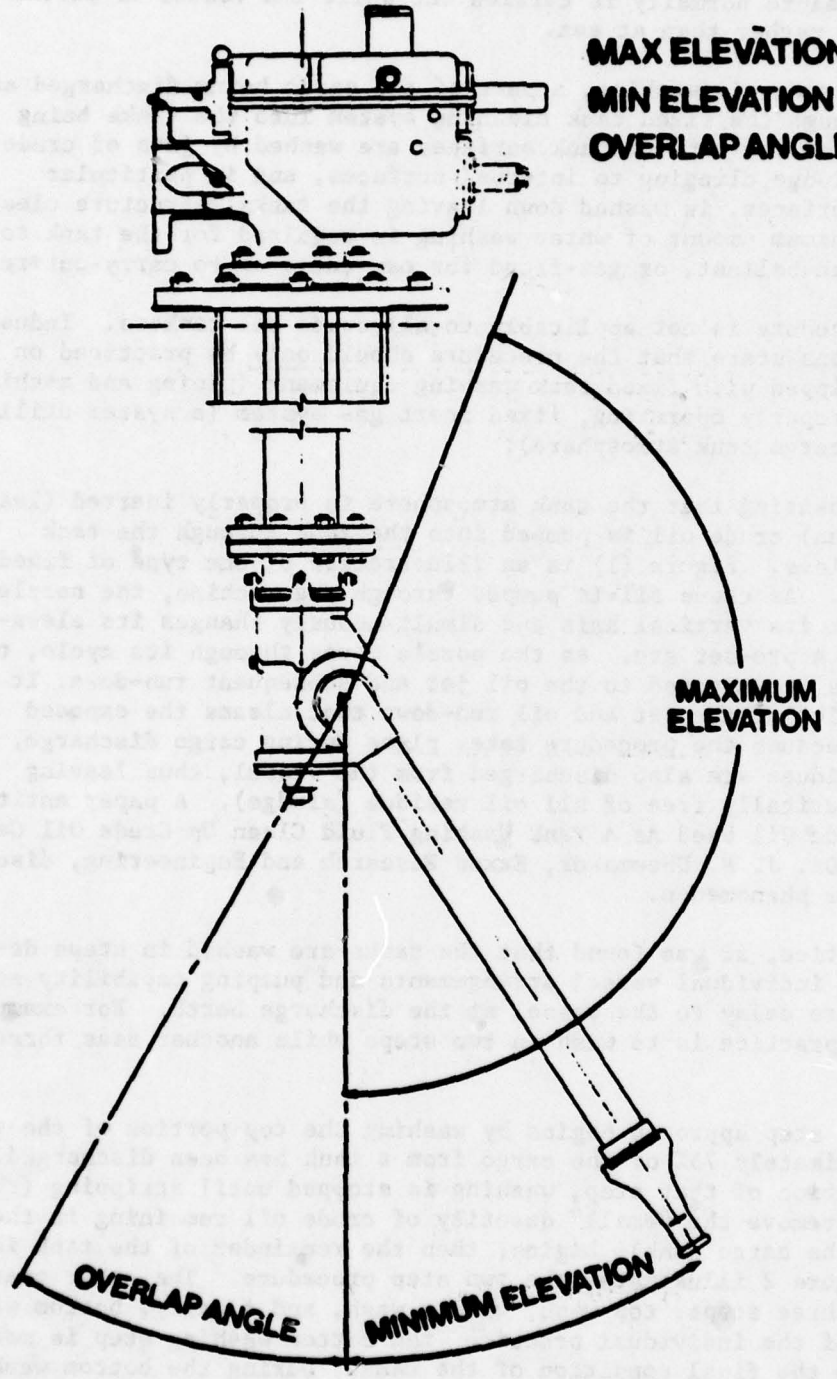
The procedure is not applicable to all crude oil tankers. Industry recommendations state that the procedure should only be practiced on ships that are equipped with fixed tank washing equipment (piping and machines) and have a properly operating, fixed inert gas system (a system utilized to control the cargo tank atmosphere).

After ensuring that the tank atmosphere is properly inerted (less than 8% oxygen) crude oil is pumped into the tank through the tank washing machines. Figure (1) is an illustration of one type of fixed tank machine. As crude oil is pumped through the machine, the nozzle rotates about its vertical axis and simultaneously changes its elevation through a pre-set arc. As the nozzle moves through its cycle, the tank surfaces are exposed to the oil jet and subsequent run-down. It is the combination of the jet and oil run-down that cleans the exposed surfaces. Because the procedure takes place during cargo discharge, the tank residues are also discharged from the vessel, thus leaving the tank practically free of all oil residue (sludge). A paper entitled "How Can Crude Oil Used As A Tank Washing Fluid Clean Up Crude Oil Cargo Residue" by Dr. J. E. Shewmaker, Exxon Research and Engineering, discusses in detail the phenomenon.

In practice, it was found that the tanks are washed in steps depending upon individual vessel arrangements and pumping capability so as to minimize delay to the vessel at the discharge berth. For example, one company practice is to wash in two steps while another uses three steps.

The two step approach begins by washing the top portion of the tank after approximately 75% of the cargo from a tank has been discharged. After completion of that step, washing is stopped until stripping (the method utilized to remove the "small" quantity of crude oil remaining in the bottom portion of the cargo tank) begins, then the remainder of the tank is washed. Figure 2 illustrates the two step procedure. The other practice is to use three steps: top wash, middle wash, and finally, bottom wash. Regardless of the individual practice, the bottom washing step is most important to the final condition of the tank. During the bottom wash, the oil flow into the tank must be balanced with the cargo stripping capacity so that the bottom is kept essentially dry. This permits optimum drainage across the bottom and allows the residue to run back to the stripping suction point. Thus, it is critical to the effectiveness of the procedure for the vessel to be equipped with an efficient stripping system.

FIGURE 1

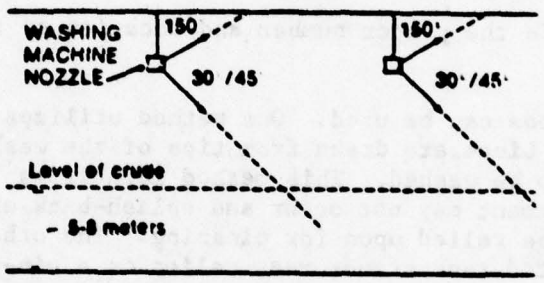


LAVOMATIC TANK CLEANING MACHINE

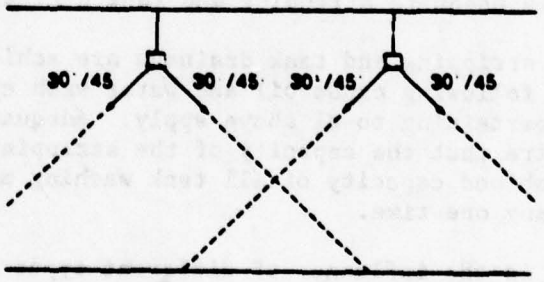
*Figure 2**

CRUDE OIL WASH

TOP WASH



BOTTOM WASH



* EXXON MARINE, VOL. 22, NO. 1, MAY 1977

Significant technical questions which must be answered to properly assess COW as an alternative to segregated ballast tanks (SBT) retrofit together with some responses are as follows:

1. How is the level of desired effectiveness defined?

The level of effectiveness is best defined as a crude oil washed cargo tank being nearly free from oil and sediment. In this regard an optimal level of effectiveness would be attained when a crude oil washing system removed sufficient oil and residue so as to make water washing unnecessary. The objective is to be able to discharge the ballast contents of such a tank directly into the sea without violating the discharge standards of International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73).

2. How is the proper number and location of fixed washing machines determined?

Two methods can be used. One method utilizes shadow diagrams during plan review. Lines are drawn from tips of the washing machines to parts of the tank to be washed. This method identifies "shadow areas" where direct impingement may not occur and splash-back effect and run down will have to be relied upon for cleaning. The other method, used in more complicated tank structures, relies on a pin-point light source to identify similar areas. The ultimate determination of course is a visual inspection of a tank following a crude oil wash.

3. How is adequate stripping and tank drainage defined?

Adequate stripping and tank drainage are achieved when the tank bottom is dry following crude oil and water wash cycles. In this regard the comments pertaining to #1 above apply. Adequate stripping and drainage require that the capacity of the stripping system be sized to exceed the combined capacity of all tank washing machines which may be operating at any one time.

4. What is the influence of different types of crude oil on crude oil washing effectiveness?

This can be checked by utilizing different crude oils for COW and determining effectiveness as discussed in comments above. Most experience has been gained with Arabian crudes, while little or no experience has been reported with crude oils from the Western Hemisphere.

5. How is it insured that properly trained crews are aboard, including adequate manning during the period when close supervision is essential?

Qualifications of persons in charge of crude oil washing operations must include previous experience with COW or completion of an approved training program. Further, such a person should be familiar with the specific equipment aboard that ship and the contents of its Operation and Equipment Manual. Other persons responsible for particular

COW operations should have commensurate experience and/or training. This should be verified and controlled during the inspection of COW in port. Port authorities can require a certificate prior to permitting COW to insure training and manning are adequate.

6. What control measures can be established to insure desired effectiveness?

Good initial design of the COW system, particularly with regard to location of fixed washing machines and adequacy of the stripping system, is an important measure to insure COW effectivess. Other measures to be considered by the owner/operator include; crew training, examination of oil record books, tank inspection, and examination of ballast discharge.

The following advantages and disadvantages have been identified with COW:

4.1.1 Advantages

The primary advantage of crude oil washing is that it provides a method whereby nearly all residue and sediment can be removed from cargo tanks and discharged with the cargo. This in turn provides two benefits; one in the form of increased economic return because of greater cargo outturn, and the other in the form of a reduction in potential for operational pollution.

The potential for operational pollution is reduced because of the relatively small quantities of oil/water mixtures which must be handled following a crude oil washing cycle. These reductions are accounted for as follows:

Cargo tanks utilized for clean ballast (arrival ballast) require only a short water rinse.

Cargo tanks utilized for dirty ballast (departure ballast) have only small quantities of oil remaining.

Cargo tanks not required for ballast need no water washing, therefore there is less oily-water mixture which must be processed by load on top (LOT). LOT is a pollution prevention measure which is designed to reduce aggregate amounts of oily-water mixtures.

Tanker operators have an economic incentive to perform COW. There is a greater and more consistent outturn of cargo, which means the ship has increased cargo carrying efficacy. Further, because less seawater is introduced into cargo tanks and piping, cargo is of slightly higher quality. Removal of residue from cargo tanks by COW reduces both periodic cleaning costs and cost of preparation for shipyard entry. This in turn contributes towards a reduction in potential for operational pollution by reducing the overall quantity of oil remaining in the tanks.

COW has proven to be cost effective on large tankers (100,000 DWT) and in many cases pays for system installation in 3-5 years.

4.1.2 Disadvantages

a. More time is required at the terminals if COW cannot be completed within the time alloted for discharge of cargo. This is a function of the ability of specific terminals to receive cargo and the number of tanks to be cleaned.

b. Some types of crude oil probably cannot be used in the COW process. In these instances alternative arrangements would be necessary for prevention of operational pollution (clean ballast or segregated ballast).

c. COW can result in an increased level of cargo vapors being discharged to the atmosphere. This occurs when tanks are ballasted following a crude oil wash. Prevention requires simultaneous ballasting and cargo discharge with commensurate piping design to allow "cascading" of vapors from one tank to the next. This becomes more complicated because trim requirements must also be taken into consideration. Trim can be an important consideration, especially during bottom washing and stripping operations.

d. Effective COW is dependent upon operational procedures and equipment maintenance as well as good design. On-site inspection and supervision can minimize the operational problems. Thorough predesign consideration as well as design review and prequalification tests can minimize design problems.

In addition to technical questions which must be answered regarding COW, the application of COW as an alternative to SBT raises additional issues.

For safety reasons COW requires that an Inert Gas System be installed and used; therefore, the economic incentive for COW diminishes as vessel size decreases. These costs stay nearly constant while the benefits decrease in proportion to vessel size. Thus, as vessel size decreases, so does the economic incentive for its installation. The size vessel where COW becomes unattractive is not precisely known and is affected by additional factors such as vessel age, crew qualifications, design and capacity of installed stripping systems, and terminal receiving capabilities. However, if inert gas systems are required for all tank vessels the economic incentive as a competitive advantage for COW increases.

Crude oil washing applies as its name suggests - to crude carriers. Because it cannot be used aboard product carriers, it cannot be considered as an alternative for SBT aboard those vessels.

Thus, from an economic viewpoint, application of COW is best suited for installation aboard large crude carriers. Installation aboard smaller crude carriers still provides pollution prevention benefits, however, the cost recovery time is longer.

4.2 International Developments

During the past several years, the Intergovernmental Maritime Consultative Organization (IMCO) has been considering the application of the segregated ballast concept to existing oil tankers. Segregated ballast

is a design concept which has been internationally accepted for new oil tankers of a size greater than 70,000 DWT as a means of virtually eliminating operational pollution arising from the handling of dirty ballast.

In May 1976, the Coast Guard indicated in an Advanced Notice of Proposed Rulemaking (CG 76-075) that consideration was being given to amending current regulations to require the retrofitting of certain existing oil tankers with segregated ballast. Many comments on the Advanced Notice, especially from tanker operators, suggested retrofitting of segregated ballast was uneconomical. As an alternative, crude oil washing was suggested as a more efficient means of controlling operational pollution from certain oils.

In his message of 17 March 1977, President Carter announced his "Tanker Initiatives". Included in the initiatives is a requirement that within 5 years all oil tankers of a size greater than 20,000 dead weight tons (DWT) are to be fitted with segregated ballast. Further, the message included provisions for acceptance of alternatives or technological improvements which provide the same degree of protection against pollution. President Carter also directed that international negotiations begin to upgrade the existing international standards to include the specific items contained in the initiatives. Thus, the United States at IMCO proposed that international accords be modified to require segregated ballast on all oil tankers greater than 20,000 DWT. As a result other governments countered the U. S. proposal by suggesting that crude oil washing should be considered in lieu of segregated ballast retrofit.

In May 1977, in response to the Presidential Initiatives, the Coast Guard indicated in a Notice of Proposed Rule Making (77-058) that consideration was being given to amending current regulations to require new and existing tank vessels 20,000 DWT or above to have segregated ballast tanks. As with the May 1976 Notice many tanker operators suggested in their comments that COW should be allowed as an alternative to SBT as a more effective means of controlling operational pollution.

During the Joint Maritime Safety Committee/Marine Environmental Protection Committee (MSC/MEPC) Meeting in October 1977, crude oil washing was considered in some detail as a possible equivalent alternative to segregated ballast installations for existing crude carriers. A special Working Group of the proponents of crude oil washing was set up at the Joint Meeting to:

(a) supply written answers to questions relating to crude oil washing posed by the United States; and

(b) to consider the proposed United Kingdom amendments to Regulation 13 of Annex I of MARPOL 73, as contained in MSC/MEPC/INF. 22, whereby crude oil washing would be accepted as an alternative to segregated ballast.

The proponents of crude oil washing replied to the questions posed by the United States and both the questions and the replies are contained

as Annex XIX of MSC/MEPC/10. The proponents also considered the United Kingdom proposal (MSC/MEPC/INF. 22), and the prepared proposed revised requirements for crude oil washing systems contained at Annex XXII of MSC/MEPC/10.

Several Delegations were critical of the material developed by the Working Group. Because general agreement could not be reached that the information in Annexes XIX and XXII of MSC/MEPC/10 was sufficient to evaluate crude oil washing, it was decided that the answers to the questions and the specific requirements should be further developed by a Working Group at the eighth session of MEPC in December 1977.

The Joint Meeting also recommended that the MEPC Working Group should consider the preparation of "Guidelines for the design, installation, and control of crude oil washing systems" to be adopted by the Organization. These guidelines should include:

- design standards;
- operational requirements;
- control and enforcement procedures.

During the week of 5-9 December 1977 at MEPC VIII, the Working Group on crude oil washing convened to discuss those items not resolved at the Joint Meeting. Draft Guidelines were developed; however, several items were left for finalization at the Tanker Safety and Pollution Prevention (TSPP) Conference. Several countries expressed concern over COW and reserved their position on acceptance of COW. They felt COW was a relatively new technique mainly conducted by some major oil companies and that it should be essential that all administrative, technical and operational aspects should be properly evaluated before crude oil washing could be considered as an equivalent alternative to segregated ballast tanks. Specific concern was expressed that there was an intention to permit crude oil washing at sea. Previous statements made at TSPP II, TSPP III and the Joint MEPC/MSC Meeting indicated that COW would normally be conducted only in port.

At the TSPP Conference (6 - 17 February 1978) discussions concerning COW continued. After much debate the principle of COW was accepted by the Conference. The following summarizes where crude oil washing is required and/or permitted as an alternative:

New Crude Oil Tankers

o Every new crude oil tanker of 20,000 tons deadweight and above shall be fitted with a cargo tank cleaning system using crude oil washing.

Existing Crude Oil Tankers

o Every existing crude oil tankers of 40,000 tons deadweight and above shall be provided with SBT, clean ballast tanks (CBT), or COW.

In addition to the abovementioned Regulations of the Protocol to MARPOL 1973, the Conference adopted two Resolutions pertaining to COW. The first (Resolution 7) deals with development of guidelines for the performance of in-port inspections of the result of tank cleaning by means of crude oil washing. The second (Resolution 15) deals with the specifications for the design, operation and control of crude oil washing systems. The Annex to this resolution contain the actual specifications. These specifications are the culmination of all the efforts that went into the development of the "guidelines". The "guidelines" now have in fact become specifications.

To put things in their proper prospective one must remember that COW was only one part of the total TSPP Conference. To appreciate the overall improvements to safety and pollution prevention, attention is drawn to the Final Act of the Conference (International Conference on Tanker Safety and Pollution Prevention, 1978) and its three attachments; Attachment 1 contains the Protocol to SOLAS 1974, Attachment 2 contains the Protocol to MARPOL 1973, and Attachment 3 contains the Resolutions of the Conference.

4.3 Economic Evaluation

In evaluating the economics of crude oil washing three independent studies were investigated. They were: a Maritime Administration Study (Tanker Pollution Abatement Report), an Exxon Study, and a study conducted by the Government of the Netherlands (for presentation to TSPP Conference).

4.3.1 MarAd Study

a. Economic Advantage:

Crude washing was proven to be a desirable process from a technical standpoint since it is more effective than water washing. However, the economics involved in crude washing will be a primary factor in determining the extent of its implementation.

An analysis was performed on the costs associated with the crude washing. The basis of this analysis is a 250 MDWT (250,000 DWT) VLCC performing a full crude wash at every discharge. The vessel is assumed to make 6 voyages Persian Gulf (PG)/North Europe each year and go to repairs every two years. A freight rate of World Scale (WS) 70 is assumed and crude oil is valued at $90/ton. Following is a summary of the analysis:

	K$/YR.
Oil recovered from sludge	32
Clingage recovered from vessel bulkheads	70
Additional cargo capacity gained by removing sludge	24
Additional cargo capacity gained by removing clingage	81
Vessel time saved en route to dock	33

Reduced costs of tank cleaning en route to dock	10
Extended discharge time	(50)
Amortization and maintenance of washing machines and piping	(75)
Net Savings	125

These economics do not represent an optimum case since optimization may vary from vessel to vessel. In practice it is unlikely that all tanks will be crude washed every voyage. Limited experience indicates that tanks should not carry more than 3 cargoes without being crude washed to prevent buildup and subsequent discharge ashore of excessive amounts of sludge. However, the primary savings are identified and quantified making it easier to modify various costs to suit a particular case.

Potentially, crude washing may provide a significant savings in corrosion reduction by minimizing or eliminating tank washing with salt water. Since corrosion abatement has not yet been substantiated, no estimate of savings is possible.

The analysis indicates that there is an economic incentive for crude washing.

b. Retrofit Costs:

Vessel (MA Design)	T6-S-93a	T8-S-100b	T10-S-101b
Deadweight	39,700	91,800	265,000
No. of fixed tank cleaning machines	52	56	104
No. of control heads	12	14	14
Estimated cost[1] to retrofit in:			
1977	$436,000	$510,000	$1,000,000
1978	$471,000	$550,000	$1,008,000
1979	$509,000	$595,000	$1,170,000

(1) Retrofit cost is based on condition that the retrofit work is accomplished during a normal overhaul; normal costs associated with such overhaul, for example gas freeing, are not included in the tabulated costs. The costs include installation of piping, valves, fixed machines, and control heads at a U.S. shipyard.

4.3.2 Exxon Study

a. Economic Advantage:

Table 1 - Retained Slops

Vessel	TONS		Percent DWT	
	WITHOUT Crude Wash	AFTER Crude Wash	WITHOUT Crude Wash	AFTER Crude Wash
Esso Malaysia (190M dwt)	1,200	790	0.62	0.32
	1,200	350	0.62	0.18
Esso Copenhagen (250M dwt)	1,200	836	0.48	0.34
	1,200	889	0.48	0.36
Esso Okinawa (250M dwt)	1,200	678	0.48	0.28
Esso Osaka (250M dwt)	1,200	671	0.48	0.28
	1,200	689	0.49	0.28

The difference between WITHOUT COW and AFTER COW is the amount of crude oil recovered and delivered ashore.

Table 2 - Economic Considerations

Six voyages Persian Gulf/North Europe (P.G./NE/year)	=	12 voyages
Sludge build-up @ 200 tons/voyage	=	2,400 tons
Oil content @ 45 percent	=	1,080 tons
Clingage (constant) per voyage	=	1,500 tons
Total retained hydrocarbon	=	2,580 tons
Equivalent value @ $70/ton = $180,600 or $90,300/year		

b. Retrofit Costs:

Since all Exxon's VLCCs were already partially outfitted with fixed-in-place tank cleaning equipment and inert gas systems, their economics are based on the incremental cost to completely outfit a vessel. Roughly speaking, the cost of completely outfitting a vessel is about $600,000. Their incremental costs are in the order of $250,000 per vessel.

4.3.3 Netherlands Study

The results of this study will be summarized by comparing COW and SBT for three different sizes of vessels. In the case of retro-fitted SBT the cost included piping modifications, structural modifications and corrosion protection. The COW cost included fixed tankwashing machines and associated piping modifications.

1) Vessel Class 'A' (72,007 DWT)

SBT Modification	COW
$487,600	$280,000*

2) Vessel Class 'B' (209,986 DWT)

SBT Modification	COW
$1,549,000	$350,000*

3) Vessel Class 'C' (318,006 DWT)

SBT Modification	COW
$1,216,500	$390,000 *

*This is based upon the assumption that no fixed tank cleaning machines were installed. If they were fitted there would be no modifications needed nor costs involved for COW.

The Netherlands study concluded that the risk to the environment of inadvertent maloperation of L.O.T. (load on top) would be 5 times larger for SBT than for COW tankers.

For a more detailed review of the economics, attention is directed to item (7) of the bibliography.

4.4 Follow-up

As a result of decisions reached at TSPP 1978 Conference, the U. S. Coast Guard will implement regulations and procedures for crude oil washing in the following manner:

1. Regulatory - A "Notice" was published on 20 April 1978. This document sets forth our intentions with respect to the implementation of the TSPP Protocols.

2. Changes to the Marine Safety Manual (CG-495) will be incorporated to adequately cover crude oil procedures in general and COW in detail.

3. The instruction program for Coast Guard inspection personnel (Marine Safety School) will be updated to include instructions on COW procedures.

4. COW guidelines will be disseminated to the Coast Guard field merchant marine technical branches (mmt) which handle plan review for ship construction.

5. Guidelines will be provided to the Coast Guard field inspection units with respect to the tests prescribed in 4.2.10 of the specifications for the Design, Operation, and Control of Crude Oil Washing System (TSPP Resolution 15, Annex I).

In addition to the 5 items enumerated above, the Coast Guard is planning to send an inspection team to the Port of Rotterdam. The purpose would be to obtain the benefit of the Netherland's expertise and experiences in the proper control and coordination of the practice of crude oil washing. Of particular interest will be the amount of coordination necessary between the ships crew and the port authority.

5.0 CONCLUSIONS

Crude Oil Washing is a viable process for significant reduction of operational pollution for crude carriers. The economics of crude oil washing are proven and COW is an acceptable alternative to SBT from an operational pollution standpoint for existing vessels. Because COW is operational as opposed to constructional, certain precautions must be observed to insure that COW is being conducted in the most effective and safest way possible.

It is felt that if the "Specifications" as developed by the TSPP Conference are adhered to, then COW will be a safe and effective way to reduce operational pollution as well as to economically clean tanks.

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APPENDIX 12

U. S. COAST GUARD IMPLEMENTATION OF PRESIDENTIAL INITIATIVE FOR AN EVALUATION OF DESIGN, CONSTRUCTION AND EQUIPMENT STANDARDS FOR TANK BARGES WHICH CARRY OIL

1 AUGUST 1978

Executive Summary

The Coast Guard in response to the Presidential Initiatives was charged with evaluating the design, construction and equipment standards for tank barges. In 1971 the Coast Guard first proposed rules for pollution prevention from vessels and oil transfer facilities. Specific design and construction standards for tank barges were a small part of this package. The bulk of these requirements were published as final rules in 1972 and have been continuously updated over the years. However, the design and construction standards for tank barges were not immediately implemented due to public comments on their need and effectiveness. A major study of tank barge design and construction alternatives for pollution prevention was undertaken as a joint Coast Guard/Maritime Administration project and resulted in the "1974 Tank Barge Study."

A review of all the previous work done in the area of tank barge design and construction standards led to the conclusion that the one factor that had not been adequately investigated was the need for revised tank barge design and construction standards. A contract was awarded to Automation Industries, Vitro Laboratories Division, to identify the magnitude of the tank barge source pollution problem and to determine the causes of that pollution. This "Tank Barge Oil Pollution Study" was completed in February 1978 and establishes the need for additional measures to control the tank barge oil pollution problem.

These two major studies along with additional in house information show that a double hull design and construction standard should be required for all new tank barges. The existing tank barge fleet will also have

to be modified if the problem of oil pollution from tank barges is to be brought under control in a timely manner.

Therefore, the Coast Guard has initiatited a regulatory project which will propose double hull construction for all new tank barges and will publish an Advance Notice of Proposed Rulemaking for existing barges to receive comments from all interested parties as to how the existing tank barge fleet can be treated to prevent pollution caused by hull damage.

Objective

The objective of this evaluation was to assess the need for upgrading design, construction and equipment standards to prevent pollution from tank barges which carry oil.

Background

In conjunction with the "Presidential Initiatives" announced by President Carter in his March 17, 1977 message to the Congress recommending measures to control the problem of oil pollution of the oceans, the following statement was made:

> "ADDITIONAL INITIATIVES"
>
> Along with the major actions just discussed, the President is directing the Secretary of Transportation in cooperation with the Environmental Protection Agency and other appropriate agencies, to undertake several studies of other promising programs and techniques for reducing marine oil pollution. These studies will include:
>
> . An evaluation of design, construction and equipment standards for tank barges which carry oil.[1]

In December 1971 the Coast Guard published an Advance Notice of Proposed Rulemaking discussing the prevention of pollution from vessels and large oil transfer facilities. These concepts were proposed under the authority of the Water Quality Improvement Act of 1970. One of these proposals

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1. White House Fact Sheet, Office of the White House Press Secretary, 18 March 1977.

would have required all inland tank barges built after a specified date to be designed and constructed with a double wall (sides and fore and aft ends). This proposal was intended to reduce the many leaks from barges in the inland waterways resulting from routine operational side and end damage. Additionally, this requirement was expected to substantially reduce the oil spills resulting from minor vessel collisions and rammings.

The inland barge industry entered strong objection to this proposed requirement. The basis for the objection was that the costs had not been adequately investigated and the effectiveness of the measure to significantly reduce oil pollution was questionable. Thus, when certain final regulations were published in 1972, implementation of the double wall construction standard was withheld pending further study.

The Coast Guard then, in cooperation with the Maritime Administration, entered into a study of costs and alternatives available to correct the barge pollution problem. The "Tank Barge Study," NTIS #COM-75-10284/AS, was completed in October 1974. As a part of the study, a special damage survey collected information on all the damage occurring to tank barges for a one year period (fiscal year 1973). In addition, the views of Coast Guard inspection personnel were solicited as to the effectiveness of various design and construction proposals in preventing pollution due to the observed damage. At the same time a tank barge fleet profile was developed to identify the construction features of individual barges. As part of this study, the Maritime Administration contracted Breit Engineering, Inc. to perform a cost analysis of the various design and construction alternatives that were investigated.

Much of the information and the results of the study appeared in the paper, "Alternative Inland Tank Barge Designs for Pollution Avoidance," which was presented to the Society of Naval Architects and Marine Engineers in May 1974. The presentation of this paper and circulation of the final Tank Barge Study Report afforded opportunities for comment on the study.

The 1974 Tank Barge Study did a very good job of examining the alternatives that might be utilized for alleviating oil pollution from tank barges. A by-product of the study was the comprehensive fleet profile that is now maintained for tank barges by the Coast Guard. Also, the life cycle costs data generated for the various design and construction standards established the costs that could be expected from any regulatory action in this area.

The 1974 study did not adequately establish the need for new design and construction standards. The pollution data available during the study period was of marginal quality since the comprehensive Pollution Incident Reporting System, PIRS, having only been established in 1971 was still in its infancy. The data was incomplete and contained a high percentage of unknown sources of pollution. Analysis of the data indicated that a large percentage of the oil pollution did not involve hull damage and could be curtailed by operational controls. Since operational controls had been required in early 1972 and there was no clear evidence of a need for costly new design and construction standards, regulatory action in this area was left pending. Priority was given to the larger problem of tankship pollution. Public attention was being focused on this area and the potential for overall pollution reduction was greater.

The 1973 International Convention for the Prevention of Pollution from Ships was completed in November 1973 and U.S. implementation of these measures had to be completed. Thus, from the management viewpoint the allocation of finite resources to solving the tankship problem was more justified. The decision was made to address tankships at that time rather than tank barges.

Discussion

The Coast Guard, in accordance with the Presidential Initiatives, allocated the resources to evaluate the design, construction and equipment standards for tank barges which carry oil. Review of the material discussed in the background section indicated that the need for new standards had to be thoroughly investigated. Due to the limited personnel resources available to the Coast Guard as a result of the ongoing international and domestic pollution prevention effort, it was decided that a contract would be awarded to study the pollution and casualty information for tank barges. The objective of the study was to identify the magnitude of the tank barge pollution problem and to determine the causes of that pollution.

On 13 July 1977 Automation Industries, Inc. was contracted to perform the study and submitted a final report number CG-M-2-78, "Tank Barge Oil Pollution Study," in February 1978. The sources of data for the study were the Pollution Incident Reporting System, Commercial Vessel Casualty Reporting System, Inspected Barge File and District Penalty Files, which

are all Coast Guard data systems. The data was reviewed for various geographic areas to develop a data base representive of all aspects of tank barge operations. District Penalty Files were reviewed to verify the data in the Pollution Incident Reporting System.

The data used extended over a three year period from 1974 through 1976. These were the most recent years for which complete data was available. The validity of the data was considered to be much better than that used in previous studies due to the maturity of the PIRS system and the increased emphasis placed on pollution prevention in recent years. This data, encompassing 90% of the oil volume spilled from barges and 75% of the total number of tank barge oil pollution incidents during that three years, ensures that an adequate base was utilized.

The amounts of oil pollution from all sources in and around U.S. waters (1,149,796 barrels) and attributed to vessels (410,292 barrels) are shown in Figures 1 and 2 for the years 1975 and 1976. The amounts of pollution vary widely from year to year. Figures 1 and 2 give an accurate picture of the pollution problem only for those 2 years. Table 1 shows the amounts of pollution from tankships and tank barges for the years 1971 to 1977. If the two indicated catastrophic tankship incidents are removed from the tankship data, the amounts of pollution in and around U.S. waters from barges slightly exceeds that from tankships. Therefore, oil pollution caused by tank barges in and around U.S. waters is considered by the Coast Guard to be significant.

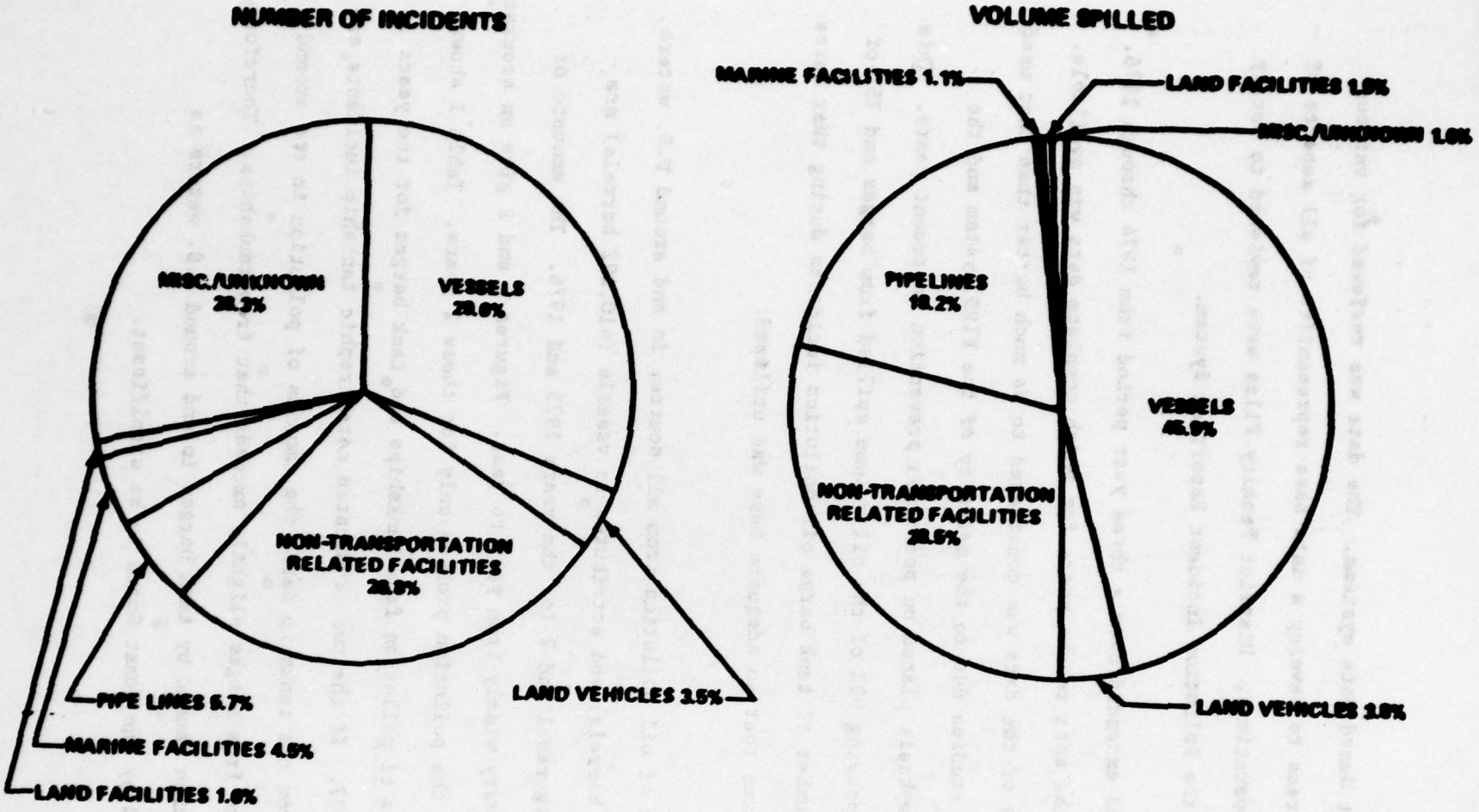


FIGURE 1 OIL POLLUTION FROM ALL SOURCES: 1975-1976

(Source: CG-487, Polluting Incidents in and Around U.S. Waters)

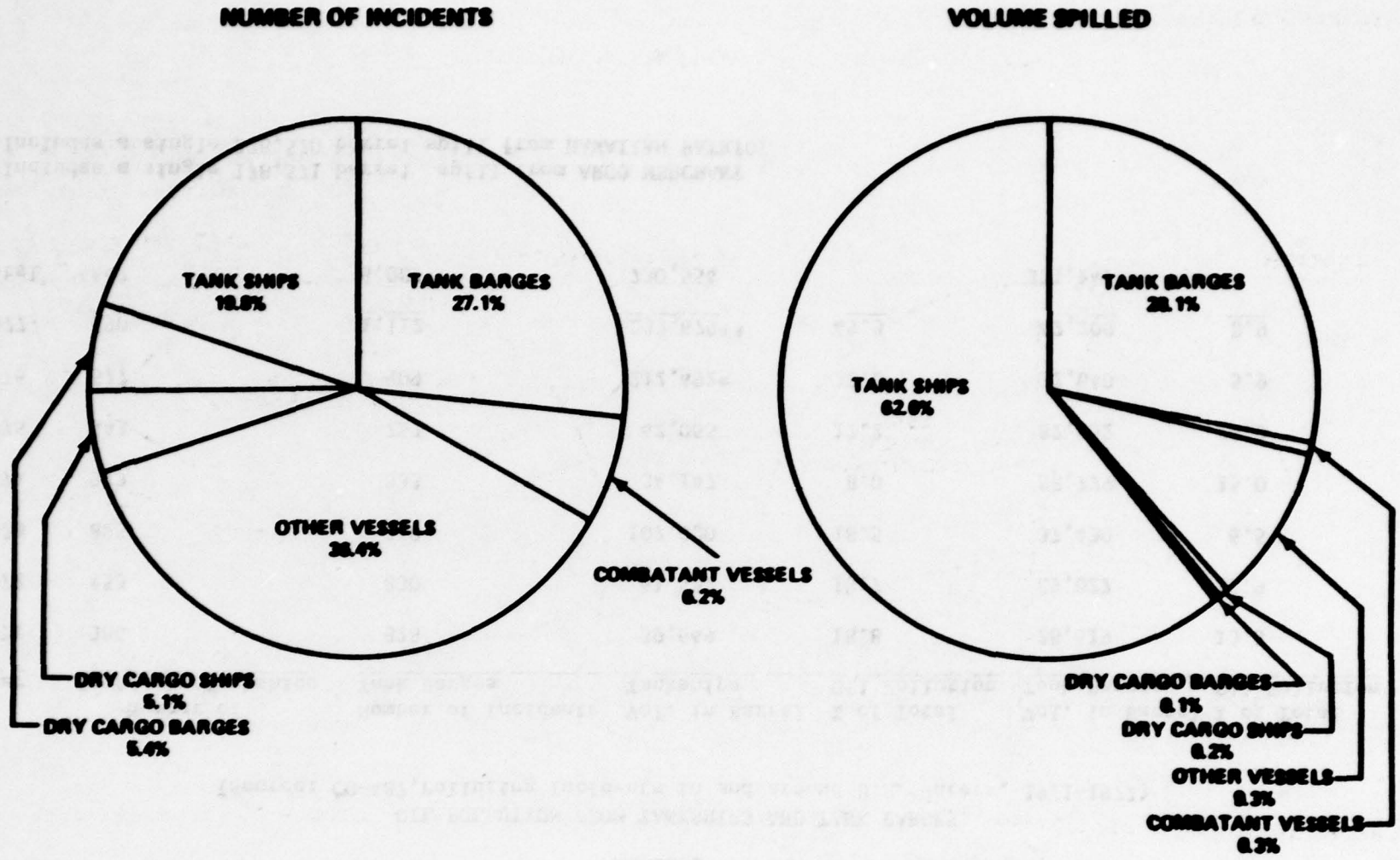


FIGURE 2 OIL POLLUTION FROM MARINE VESSELS: 1975-1976

(Source: CG-487, Polluting Incidents in and Around U.S. Waters)

TABLE 1

OIL POLLUTION FROM TANKSHIPS AND TANK BARGES
(Source: CG-487,Polluting Incidents in and around U.S. Waters, 1971-1977)

Year	Number of Incidents Tankships	Number of Incidents Tank Barges	Vol. in Barrel Tankships	% of Total Oil Pollution	Vol. in Barrel Tank Barges	% of Total Oil Pollution
1971	386	828	39,649	18.8	28,519	13.6
1972	453	830	61,522	13.7	89,027	19.9
1973	825	718	107,000	18.5	37,430	6.5
1974	973	833	34,147	8.0	58,779	15.0
1975	643	757	42,065	12.2	82,552	24.0
1976	577	909	212,492*	38.6	32,640	5.9
1977	590	1,112	233,679**	49.3	42,200	8.9
Total	4447	6,087	730,554		371,147	

* Includes a single 178,571 barrel spill from ARGO MERCHANT
** Includes a single 228,570 barrel spill from HAWAIIAN PATRIOT

The Automation Industries study analyzed the 173,971 barrels of oil spilled by barges during the three year period (1974-1976). This analysis shows that the Coast Guard is faced with a two part problem. On one hand, there are a large number of small spills resulting from oil transfer operations which account for only approximately 10% of the total volume. On the other hand, there are a small number of incidents which occur during barge transport of oil that spill approximately 85% of the total volume. This spillage is due mainly to hull damage. These results are shown in Figure 3. To prevent pollution due to oil it will be necessary to solve the problem of spillage during barge transport. A need for further regulatory action is indicated.

The hull damage to barges is attributable to many causes. Fleeting operations(making up of the barges for towing), groundings or rammings are typical examples. A substantial portion of these incidents may be attributable to operator error. However, the nature of barge operations, especially on inland waters, is such that "higher" personnel standards will not solve the problem. The margin for error in fleeting operations and navigation on the inland waters is very small. It can reasonably be expected that minor hull damage will continue to occur in this environment.

The 1974 joint MARAD/Coast Guard study examined techniques for prevention of oil pollution from tank barges using various design and construction standards. It is estimated that approximately 90% of the pollution due

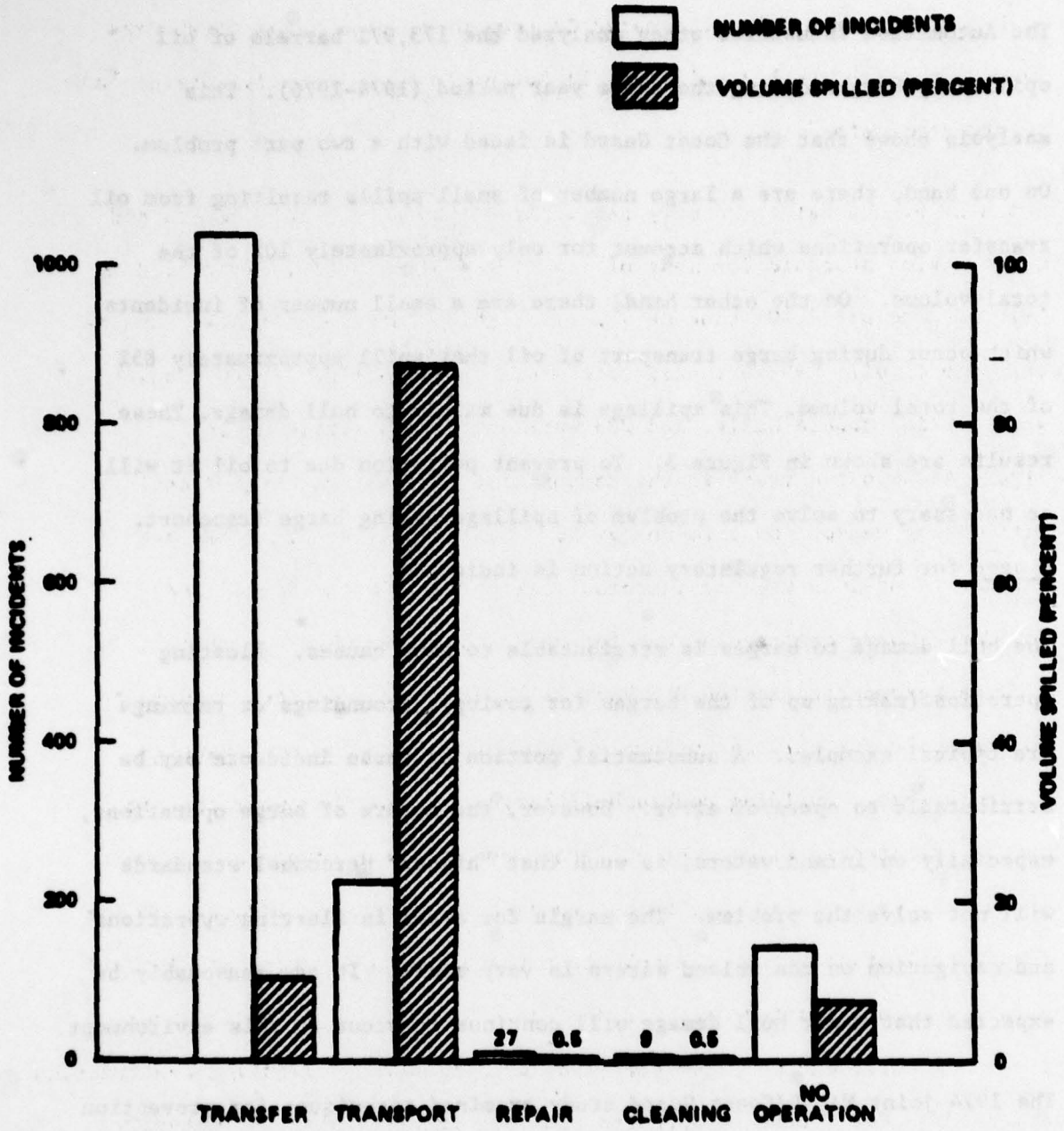


FIGURE 3 NUMBER OF TANK BARGE OIL SPILL INCIDENTS DURING MAJOR TRANSPORT AND NON-TRANSPORT ACTIVITIES: 1974-1976

(Source: Tank Barge Oil Pollution Study by Automation Industries, February 1978)

to hull damage could be eliminated if the entire tank barge fleet were converted to the double hull (double bottoms, sides and ends) design and construction standard.

Since 1970, the barge industry has utilized the double hull design and construction standard for many of the barges being built. From 1970 to 1977 of a total of 601 tank barges built which were certificated for the carriage of oil, 198 were built with full double hulls, 120 were built with partial double hulls, and 283 were built with single hulls. Figure 4 shows the trend in the composition of the tank barge fleet. Part of the reason for this change to a double hull standard has been the desire of industry for increased flexibility in the barge fleet. The Coast Guard has regulations for unmanned barges which carry certain bulk dangerous cargoes (46 CFR Part 151). These regulations require double hulls for certain extremely flammable, corrosive or unusually toxic cargoes. Building double hull barges insures the owner that it can be operated in either the oil trade or dangerous cargo trade. Part of the change may also have been a voluntary movement by industry to the double hull standard for oil pollution prevention since many double hull barges are certificated only for the carriage of oil. This trend has been considered during prior decisions on tank barge design and construction standards. For a time it appeared that the industry might voluntarily change over to a double hull standard and solve the problem without regulatory action. While the numbers show a significant move in this direction, regulatory action now appears necessary for a total double hull construction standard for all new barges.

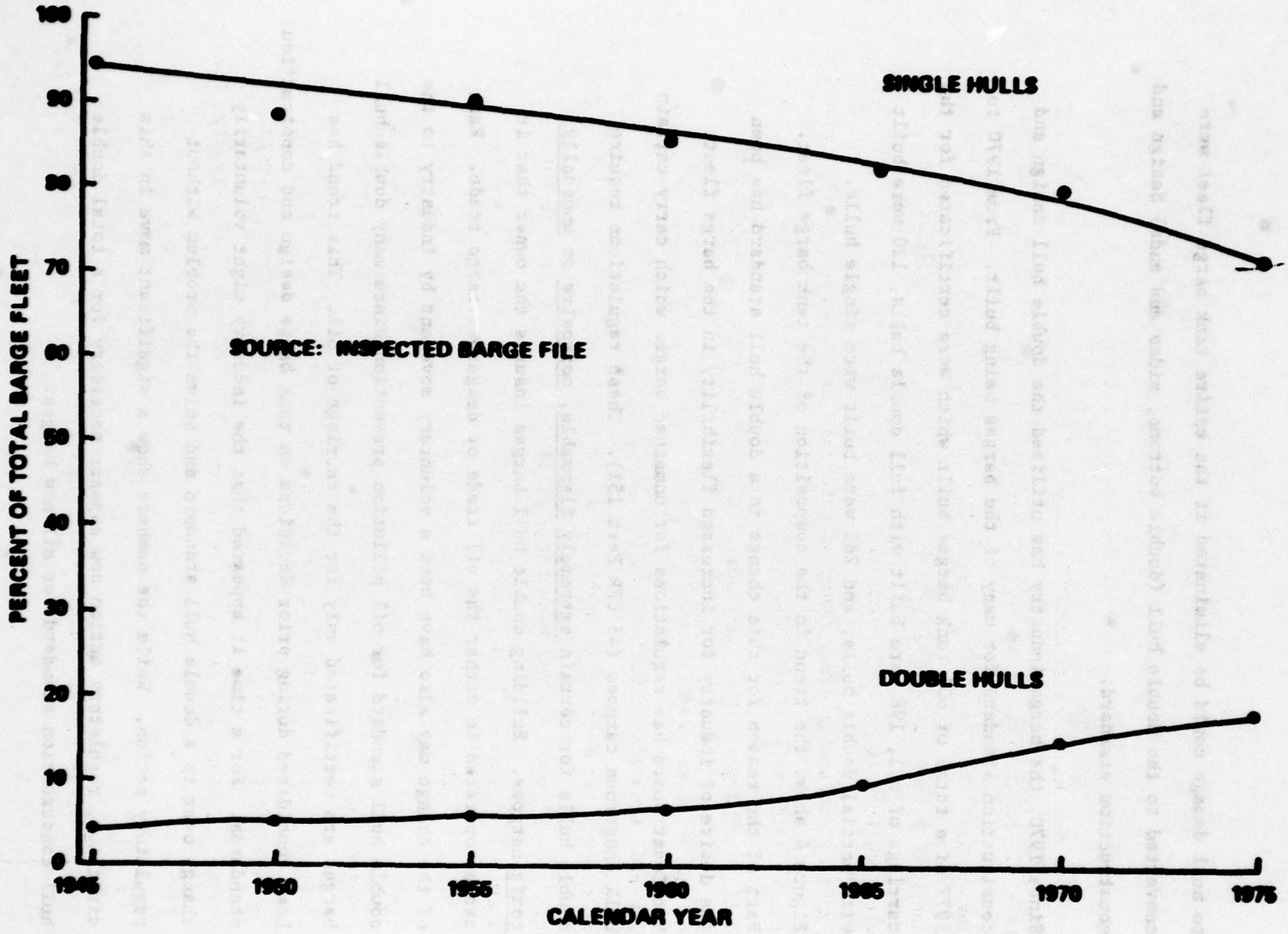


FIGURE 4 SUBCHAPTER D BARGE TYPE CONSTRUCTION TRENDS

(Source: Coast Guard Inspected Vessel File)

Cost

The 1974 study also looked at costs for new construction of barges with various design and constuction features. Table 2 shows the total initial construction costs for the various alternatives in 1974 dollars. These costs are presently being updated by the Maritime Administration and will be available shortly. The cost of a double hull tank barge would be from 26 to 80 thousand dollars more than for a single hull barge of comparable size. Part of this cost can be offset by the reduction in oil pollution clean up costs that will result from the use of double hull tank barges. The Coast Guard does not now have authority to require the industry to report the cost of clean up. When federal funds are expended from the Pollution Fund or cost information is voluntarily supplied, cost data is available in the PIRS system. From 1973 to 1978 there have been 998 tank barge spills of over 100 gallons which, from the Automation Industries study, usually indicates hull damage. Cost data, (that is probably incomplete), is available for only 156 cases of the 998 total. A total of $12,768,732.00 have been expended for these cases. This does not include cost for Coast Guard or any other federal or state agency personnel involved in these pollution incidents and may not include the owners/ operators additional costs. The implications for savings in clean up costs are therefore very significant.

The 1974 study calculated the costs for retrofitting the existing barge fleet. The total cost for retrofitting the existing barge fleet in 1974

TABLE 2 NEW CONSTRUCTION WEIGHTS AND COSTS FOR TANK BARGES

BARGE CONFIGURATION	NEW CONSTRUCTION WEIGHTS IN SHORT TONS OF STRUCTURAL STEEL AND DECK FITTINGS			TOTAL INITIAL CONSTRUCTION COSTS FOR NEW BARGES THOUSANDS OF DOLLARS		
	BARGE SIZE (length in ft.)			BARGE SIZE (length in ft.)		
	195	240	290	195	240	290
Single Skin	218	388	539	180.1	285.7	380.1
Single Skin with Increased Scantlings	234	414	566	189.7	301.3	396.3
Single Skin Strengthened in Selected Areas	247	432	584	197.5	312.1	407.1
Double Wall with Trunk	267	426	587	203.6	300.7	399.2
Double Hull with Trunk	272	490	692	206.6	339.1	462.2

1974 dollars

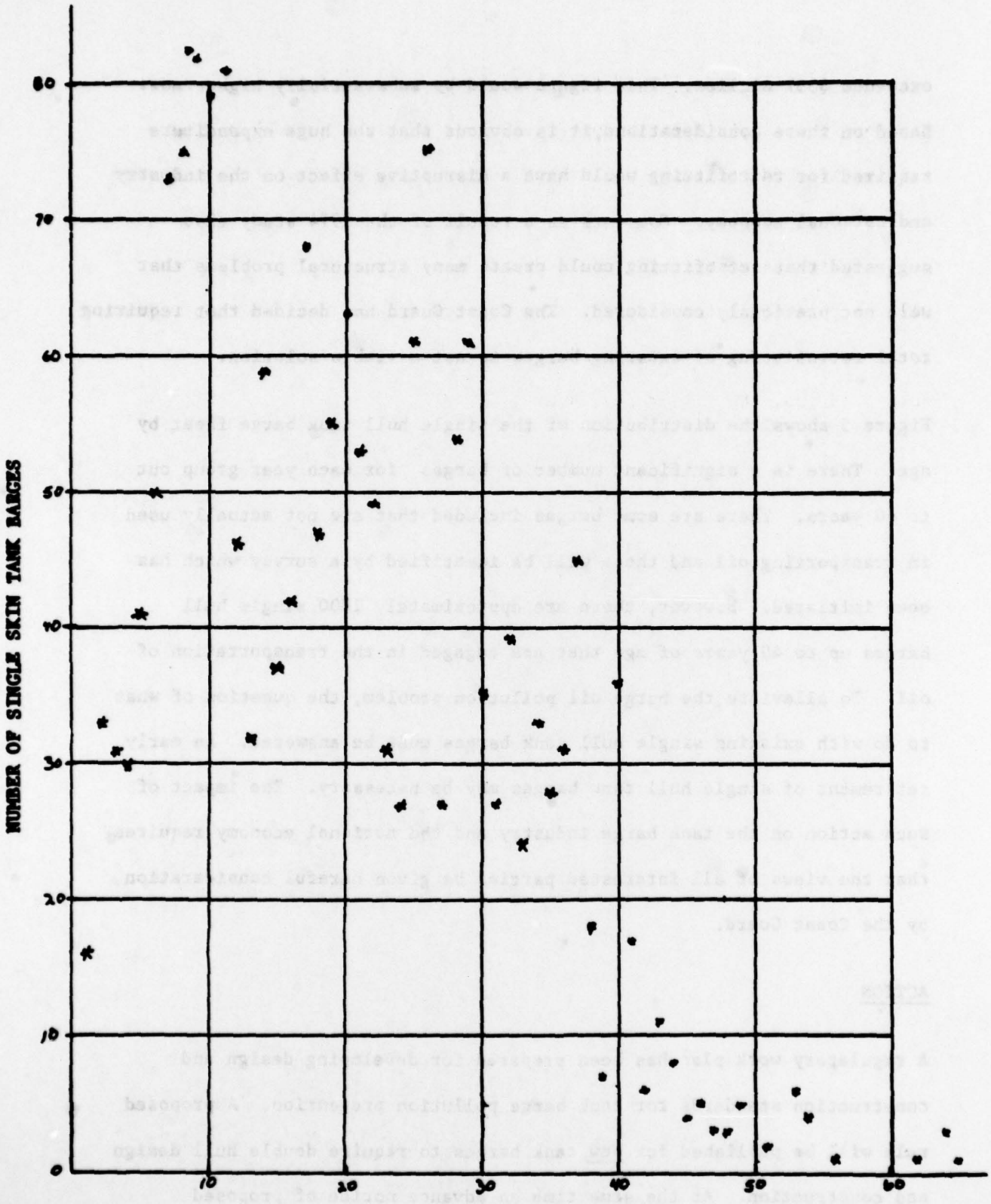
(Source: Joint Coast Guard/MARAD 1974 TANK BARGE STUDY)

exceeded $357 million. This figure would be substantially higher now. Based on these considerations, it is obvious that the huge expenditure required for retrofitting would have a disruptive effect on the industry and national economy. Comments as a result of the 1974 study also suggested that retrofitting could create many structural problems that were not previously considered. The Coast Guard has decided that requiring total retrofitting of existing barges is not a viable solution.

Figure 5 shows the distribution of the single hull tank barge fleet by age. There is a significant number of barges for each year group out to 40 years. There are some barges included that are not actually used in transporting oil and these will be identified by a survey which has been initiated. However, there are approximately 1800 single hull barges up to 40 years of age that are engaged in the transportation of oil. To alleviate the barge oil pollution problem, the question of what to do with existing single hull tank barges must be answered. An early retirement of single hull tank barges may be necessary. The impact of such action on the tank barge industry and the national economy requires that the views of all interested parties be given careful consideration by the Coast Guard.

ACTION

A regulatory work plan has been prepared for developing design and construction standards for tank barge pollution prevention. A proposed rule will be published for new tank barges to require double hull design and construction. At the same time an advance notice of proposed



Base year (0) 1977

(Source: Coast Guard Inspected Vessel File)

FIGURE 5

rulemaking will be published covering existing tank barges. The purpose will be to solicit ideas as to how existing single hull tank barges can best be treated to reduce pollution due to hull damage. A regulatory analysis will be prepared. A lengthy comment period will be given and public hearings on the East Coast, West Coast, Gulf Coast and Rivers will be held. This regulatory action was included in the Department of Transportation Regulations Agenda published in the Federal Register, Volume 43, No. 106 - Thursday, June 1, 1978.

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