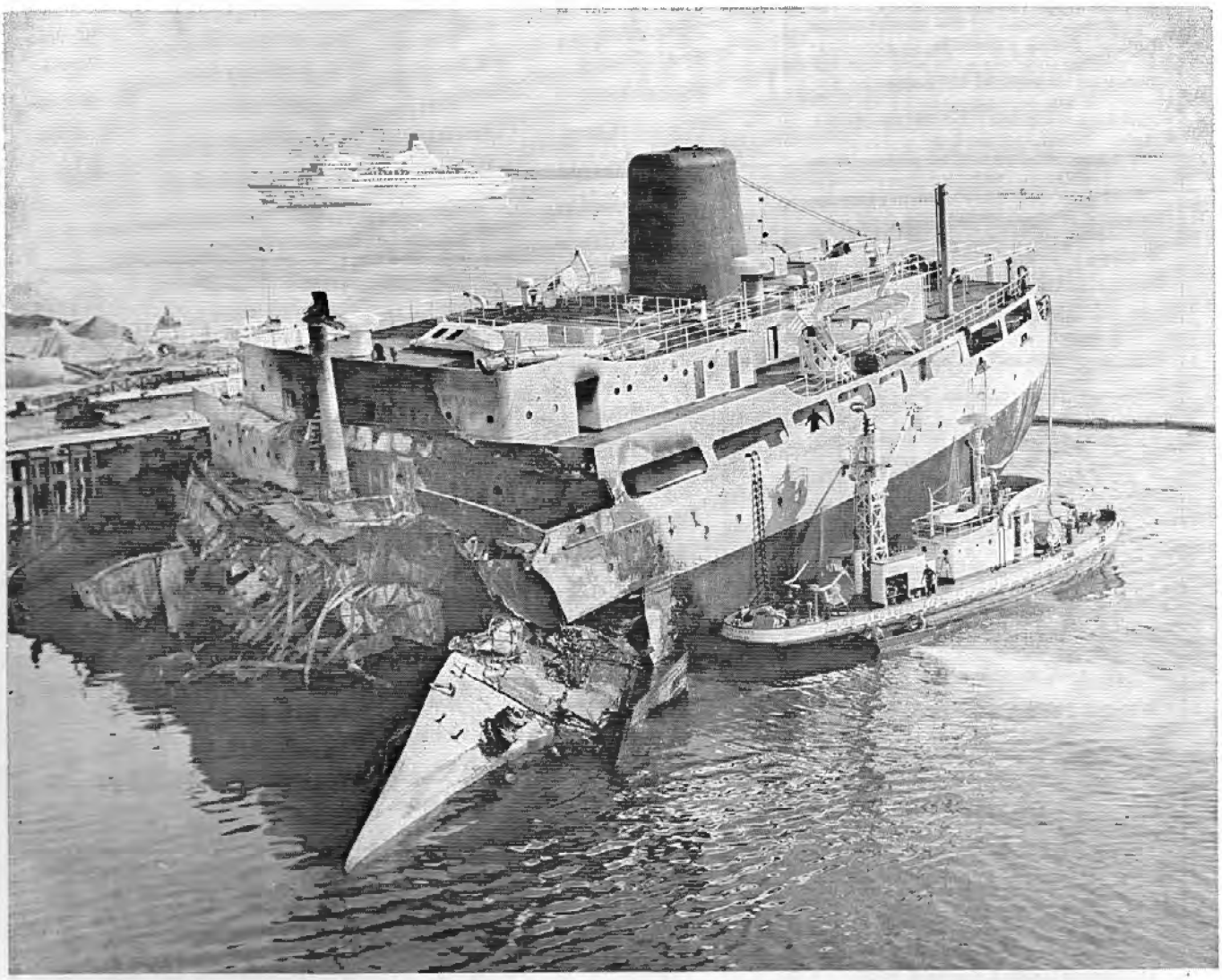
PROCEEDINGS
OF THE MARINE SAFETY COUNCIL



DEPARTMENT OF TRANSPORTATION **UNITED STATES COAST GUARD**

Vol. 34, No. 7 CG–129 **July 1977**

PROCEEDINGS

OF THE MARINE SAFETY COUNCIL

Published monthly by the Commandant, USCG, in the interest of safety at sea under the auspices of the Marine Safety Council. Special permission for republication, either in whole or in part, with the exception of copyrighted articles or artwork, is not required provided credit is given to the Proceedings of the Marine Safety Council. All inquiries and requests for subscriptions should be addressed to Commandant (G–CMC), U.S. Coast Guard, Washington, D.C. 20590. Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, March 12, 1974.

CONTENTS

FEATURES

DEPARTMENTS

COVER

The stern section of the SS *Sansenina* rests alongside the Union Oil Terminal dock at San Pedro, California, following the explosion which ripped her apart last December 17. The 810-foot tanker had just completed discharging her cargo of crude oil and was taking on ballast when the vapors above deck ignited and the flame carried into the cargo tanks. The blast left eight dead and dozens injured, and dumped 20,000 gallons of bunker oil into the harbor. Although the investigation into the causes of the casualty is not complete, the Coast Guard believes that the installation and proper use of an inert gas system on tank ships could prevent most accidents of this type.

The *Sansenina* casualty was one of a series of tanker accidents which prompted President Carter to order the development of a set of regulations designed to improve the safety of oil tankers—both U.S. and foreign—calling at U.S. ports. The resulting proposed rules are the subject of this month's features.

DIST. (SDL No. 105)
A: acde(2); fghklmntuv(1)
B: n(50); c(16); e(5); f(4); ghj(3); r(2); bkipq(1)
C: eglmp(1)
D: i(5); adgklm(1)
E: mn(1)
F: kp(1)
Lists TCG–06, CG–13, CG–20

THIS COPY FOR NOT LESS THAN 20 READERS— PLEASE PASS IT ALONG

Proposed Tanker Regulations

On May 16, the Coast Guard published proposed rules which would establish new construction and equipment standards for oil tankers. The new regulations would apply to all oil tankers over 20,000 deadweight tons, U.S. and foreign, which enter U.S. waters. In addition, one equipment requirement would apply to all vessels, regardless of type, of over 10,000 gross tons.

Specifically, the proposals would require:

(1) double bottoms on new tankers, and segregated ballast capability on both new and existing tankers;

(2) improved emergency steering standards on all tankers;

(3) inert gas systems on all tankers; and

(4) backup radar systems with collision avoidance equipment on all vessels of over 10,000 gross tons.

These regulations are one of the measures to reduce oil pollution of the oceans which the President announced in his message to Congress of March 17. Other recommended measures in the President's program, most of which the Coast Guard is involved in developing, are:

—improvement of crew standards and training;

—a tanker boarding program and information system to identify individual tankers having histories of poor maintenance, accidents, and pollution violations;

—ratification and implementation of the International Convention for the Prevention of Pollution from Ships; and

—approval of comprehensive oil pollution liability and compensation legislation.

Publication of the proposed construction and equipment standards was announced at a press conference held in Washington by Rear Admiral William M. Benkert, Chief of the Office of Merchant Marine Safety, and Rear Admiral Anthony F. Fugaro, Chief of the Office of Marine Environment and Systems. The following is a partial transcript of that conference.

BENKERT. Good morning, ladies and gentlemen. I believe you have been given a package containing the proposed regulations and also material dealing with the environmental impact assessment that has been made of these proposals . . . .

I would like to add something from the President's message to Congress of 17 March which is a very important part of this whole concept. At the same time that we are proposing these regulations we are pursuing, in accordance with the President's message, a very strenuous program in the international community with the Inter-Governmental Maritime Consultative Organization (IMCO) looking toward the parallel development of internationally accepted standards in the same vein as our proposals. I think that is a very important part of the program that the President enunicated, and I can expand upon that in any questions you might have as to exactly what efforts are being undertaken by the United States and by other conntries looking toward international actions in this arena of regulations for pollution prevention and safety in the tanker field.

We would be very happy to try to answer any questions you may have, ladies and gentlemen.

Q. Admiral, most of these regulations would apply to ships over 20,000 dwt. What percentage of ships and what percentage of oil entering this country would this total?

BENKERT. I can't give you exact figures, but the figure of 20,000 dwt will cover the vast majority of tankers that bring imported oil into our country.

Q. Will these standards, over the next 5 years, once they are achieved, totally eliminate the likelihood of oil spills?

BENKERT. No, sir. I don't think anyhody can say that you can totally eliminate the likelihood of an oil spill. You try by a combination of design, construction, and equipment, along with the important area of per-

sonnel qualification, training, and manning, to develop a safe oil transport system as free of pollution as we can make it. But nobody can guarantee that you are never going to have a spill.

Q. Admiral, can you tell us what your plans are for enforcement; especially, what inspections will you hold, how often will you hold them, and how will that differ from what you do now to inspect ships?

BENKERT. What we would intend to do, and what are doing today to a a great extent, is to conduct specific examination procedures on all tankers, U.S. flag and foreign flag. In the conduct of these examinations we would anticipate appraising their compliance, not only with these requirements we are proposing today, but with a number of additional requirements which already do apply to U.S.-flag and foreign-flag tankers. So what this means to us in terms of enforcement within the United States —within our area of jurisdiction— is an expansion of our activities to include a greater degree of appraisal of foreign-flag tankers particularly, in order to insure compliance with appropriate existing requirements, with requirements that might result from these proposals, and with other requirements which might be forthcoming.

Also, we look for the international community to expand, intensify, and increase enforcement in their own areas of jurisdiction. I mentioned earlier that we are pursuing a number of avenues in the international community. I and other members of the Coast Guard are attending a meeing next week in London for the specific purpose of looking toward improvements, expansion, and tightening up of enforcement of requirements by other states on their own vessels.

Q. Are we saying that we are negotiating at IMCO in London, but the real thing that will do the trick will be that the Americans will put in tough rules and say that ships that don't follow the rules cannot enter our ports?

BENKERT. Not exactly. What we are saying, and what the President is saying, is that we hope to be able to achieve a degree of regulation, a degree of enforcement, and a scope of requirement, internationally accepted, suffiicient that the United States would not have to resort to extensive unilateral regulation development or enforcement. But what the President has already said is that if we don't achieve what we feel is necessary for safety and the environmental protection of the United States, then we are prepared to implement certain items unilaterally if we must.

Q. What penalties, Admiral, are envisaged for infractions?

BENKERT. The practical penalty for noncompliance with our regulations, if you are looking at United States-flag vessels, is in not permitting the vessel to sail until it does comply with the regulations and statutes, as we have done for many years. In relation to the foreign-flag vessels, there are monetary penalties permitted under the Ports and Waterways Safety Act for specific violations, but I think the major penalty is not being permitted to operate in and out of our ports. For example, if we go aboard a vessel in port and there are unsafe conditions or noncompliance with specific regulations at a particular time, we would perhaps—depending on the circumstances—forbid the vessel to either offload or load cargo. This is a rather stiff penalty.

In other cases, we might not only forbid the vessel to handle cargo within our ports, but chase the vessel out for noncompliance because of unsafe conditions. Under nur statutes there are a number of very vigorous procedures which can be followed in the appraisal and control of vessels.

Q. Admiral, have you been able to estimate, roughly, the increased cost for new shipbuilding to the industry and the added cost of the retrofitting?

BENKERT. Yes, sir. Before even trying to give you any figures, I must caution you that some of this is very difficult to appraise economically because you really don't know exactly how many ships you are going to be dealing with; you have to base this on an estimate of the vessels that we have had coming into our waters in the past and what we anticipate in the way of volume of oil importation. Therefore the figures have to be taken with a great degree of flexibility because you can't precisely project the number of ships, the amount of oil being imported, and so forth, as well as the size of the ships being retrofitted.

We have made up in conjunction with these regulatory proposals, economic impacts, and I can give you some "ballpark" figures. For example, the double bottom and segregated ballast regulatory concept as proposed—a fair estimate of the cost to the shipowners and operators to comply with these requirements over a 3 year period for retrofitting would be somewhere around $1.5 billion. The cost of the inert gas system requirement, which involves not only a new-vessel concept but a retrofit on existing vessels, we have estimated at around $1.25 billion over a 5 year period.

I would again caution you that these figures are estimates. You cannot put this down to a specific dollars-and-cents figure. Obviously, if you start talking about retrofitting of inert gas systems and segregated ballast systems on a large number of existing vessels you are talking about an increase in shipyard work worldwide. You must remember that the vast majority of vessels that are importing oil into the United States are foreign-flag vessels.

Q. Admiral, is retrofitting to be required for everything except double bottoms?

BENKERT. Basically, yes. The double bottom requirements is specifically proposed for new construction. The backup radar system with collision avoidance assist would be required on all vessels, new and existing. The segregated ballast requirement is proposed for both existing

and new vessels, but I must add in that regard, that there are already regulations which apply to the installation of segregated ballast on existing vessels. In other words, part of this has already been accomplished on certain vessels now in existence and some new construction forthcoming.

Q. In domestic trade . . . ?

BENKERT. No, sir. New U.S. flag tankers in excess of 70,000 dwt are presently required to be built with segregated ballast. That requirement is also applicable to new foreign flag tankers that transport oil into or from the U.S. Further, we presently require new U.S. flag tankers to be fitted with inert gas systems.

The proposed regulations would extend the present requirements to oil tankers of a size greater than 20,000 dwt, both new and existing. The proposed emergency steering requirements would also apply to both new and existing oil tankers.

Q. Do you have cost estimates for the other three proposals?

BENKERT. Yes, we have some. On the emergency steering requirements we have made an estimate—and we just figured this out on the basis of initial installation of equipment and/or the manning alternative which is permitted in the proposal—of $17 million for the first couple of years. The other item, collision avoidance assist radar installation, we tried to figure on a 2,400 vessel basis, an average of $120,000 per vessel. Again that is a very round figure because we don't really know the exact number of vessels, and the cost of this equipment varies between $80,000 and $160,000 depending on the degree of sophistication of the equipment. Again these are estimates.

Q. Admiral, do you have any kind of judgement as to what this might do to some of these old "rust buckets"? Are there going to be a lot of ships in the world fleet that are just going to be junked now because of these requirements?

BENKERT. Assume, for example, that we implement the segregated ballast retrofit and the inert gas retrofit. These are large expenses for a vessel. If you had an old vessel, and particularly a smaller old vessel, I would think that you would take a hard look before investing the kind of money it would cost to retrofit these vessels for our trade. And of course again what we are hoping for, and what we are working toward, is an international agreement on these requirements so that this vessel would not be shuffled, perhaps, from trade with the United States to trade somewhere else.

Q. Have you made any estimate at all on the extent of that impact?

BENKERT. In terms of specific vessels? No sir, we haven't been able to make a good estimate of that because I think it's a subjective evaluation and has to be made by the owner of the vessel. He knows how much he has invested in the vessel; he knows what his income will be; he knows what expected life he may anticipate dependent upon the age of the vessel.

Q. Do you have any evidence or any figures on how many of the tanker oil spills could have been avoided if you had had double hulls and inert gas systems?

BENKERT. Well, first of all, we are not talking double hulls; we're discussing a proposal for snlely a double bottom. We could make some estimates in specific cases. For example, we have had a number of groundings in the United States in recent years that resulted in major oil spills which would have been prevented by having double bottoms on these vessels.

We, of course, and the international community feel that inert gas systems are a very highly desirable safety feature on vessels. For example, the explosion that we had on the vessel *Sansenina* in Long Beach, California, not too many months ago—although we haven't finished our investigation of that casualty, we do believe that the installation and proper operation and maintenance of an inert gas system would prevent this type of casualty. So we are addressing both safety and direct environmental concern with a number of these regulatory proposals.

Q. Do you have anything in the works to improve the quality of the crews

BENKERT. Yes, sir, we do. Our appraisal of vessel crews, their qualifications and so forth, obviously is not contained in this particular regulatory proposal package. However, we have been working in the international community—and if I may I'll talk "international" just a little bit first because, again, the vast majority of vessels importing oil into our country are foreign-flag vessels.

For 5 years we have been pursuing in IMCO the development of a draft convention dealing with vessel personnel, specifically personnel training and watchkeeping. The United States has made efforts to influence the international community to advance the date of the conference on this issue. As a result, the conference will be held in June of next year; it had been planned originally for very late in 1978. What we look for out of that conference is an international agreement which will implement a great deal more stringent requirements for personnel qualifications, personnel experience, and the whole concept of —if I can use the term—"jacking up" the caliber of personnel aboard vessels internationally.

Now in the United States, aboard United States-flag vessels, as I'm sure most of you know, we have and have had for many years what we feel is a very extensive and rather thorough qualification program — "competence" program, if you will—for personnel on United States-flag vessels. We are taking some measures—and you will see some regulatory proposals in this vein in the quite near future—looking towards improving some of nur own procedures and qualification requirements for personnel aboard United States-flag vessels. So, concurrently with design, construction, and equipment, we are also attacking the problem of personnel

qualification in both the international and national arenas.

Q. Do you have figures for the total number of tankers, approximately, that enter the United States ports yearly, and the breakdown between American and foreign?

BENKERT. Roughly, we have. If you are talking about vessels to which these regulations might apply, we are talking about—in round figures—2,400 vessels, with the United States-flag vessels being somewhere in the vicinity of 250. I'm pulling that off the top of my head. We could give you the exact figures, but the United States-flag percentage is obviously quite small.

Q. Admiral, the Coast Guard has not, in past, favored mandatory double bottoms. Have there been any technical or economic findings or changes that would explain now why you are proposing these?

BENKERT. No, sir, I think the subject of double bottoms is still a controversial one. There are technical reasons why double bottoms do present some problems in operation of vessels. However, as the President's message indicated, when you look at them from the point of view of pollution prevention in certain types of grounding casualties, they are, obviously, a good cure for these types of casualties. I think obviously as a result of publishing and publicizing this proposal for double bottoms which you have here, we are going to receive a lot of comments both pro and con relative to this requirement, just as we have in the past.

Q. Admiral, in your economic impact analysis have you been able to determine what, if any, increase there would be in the cost of oil as a result of pass-alongs.

BENKERT. No, sir, not really, because we don't know how much oil we are going to import. I don't have the figure here right now, if that is what you are asking me.

If you break it down, as people are prone to do, to how much per gallon at the gas pump, it's a very small figure, because in the overall transportation picture and in the overall basic capital costs you are talking about a relatively small amount.

The problem, I think, there is just in trying to predict. For example, we made our estimates of the costs of these regulations on the basis of importing somewhere around 8 or 8½ million barrels a day. If that figure goes down in the future, as we would hope it would in compliance with the President's energy policy, then a lesser importation will result with lesser numbers of ships and lesser costs overall. If that figure should go up as has been projected in some areas, up to, for example, a possible figure of 12 million barrels a day, then obviously you have a 50% increase in ship capacity. So it is rather difficult to pinpoint a cost like that, sir.

Q. You said a moment ago that double bottoms present some problems in operations of vessels. What problems are these?

BENKERT. If you have a minor grounding of a vessel the double bottom would normally prevent oil being spilled because a void space is underneath your cargo tanks. [*Draws a picture*] A normal vessel today might have three cargo tanks athwartships, huh? If this vessel runs aground and you punch a hole in here you're going to spill some oil. If, on the other hand, we put this empty space between the bottom and the floor of the cargo tank, and then we run aground and punch a hole in here we are not going to spill any oil.

That's what a double bottom does for you, *provided* you don't go aground hard enough so that you punch into here [cargo tank], or so that you punch into some longitudinal or transverse framing which upsets this floor and causes it to crack, in which case you are going to get oil going down into the double bottom and eventually a spill anyway. So this is nnt a cure-all for all groundings.

The other thing is that with the double bottom you must be very careful in the maintenance of the vessel from a safety point of view to insure that you do not get leakage into that double bottom. Because if you get leakage of cargo into there, it creates fire and explosion hazards. So what I'm trying to say is that there are technical considerations which must be appraised in double bottom installations on tankers.

Q. Can American shipowners get federal aid to do these retrofittings?

BENKERT. I would suggest you talk to the Maritime Administration about that, sir. Their subsidy programs are widely known, but what they would consider in this area I cannot respond to, sir.

Q. Admiral, were these rules developed by the Coast Guard or by the Secretary of Transportation?

BENKERT. These were developed by the Coast Guard.

Q. At his urging?

BENKERT. Well, at the President's urging. The President on March 17 sent a message to the Congress in which he said: "I am instructing the Secretary of Transportation to develnp new rules for oil tanker standards within 60 days. These regulations will apply to all oil tankers over 20,000 dwt, U.S. and foreign, which call at American ports. These regulations will include double bottoms on new tankers, segregated ballast on all tankers," etc. That was the direction from the President. The Department of Transportation has seen fit, I presume you'd say, to delegate the responsibility for the development of these regulations to the Coast Guard.

Q. How many ships now meet these standards?

BENKERT. How many ships meet which standards, sir?

Q. All of them. What ships now meet the double bottom standards?

BENKERT. I would say there are maybe a couple of dozen double bottom tankers in the world today. That's a ballpark figure. There are very few double bottom tankers in the world today, sir.

Segregated ballast tankers? I can't give you a number, but there are a lot more segregated ballast tankers than

tankers with double bottoms. There are a fair number of new tankers, particular ULCC's and VLCC's that have been built in recent years, that are segregated ballast tankers. We have built a number of medium sized tankers in the United States in recent years, particularly for utilization in the TAPS trade, which are built with segregated ballast.

The collision avoidance device concept? There are maybe 300 vessels worldwide that are fitted with the most modern equipment in this area.

The emergency steering standards? There are only a relatively few vessels that can comply with these proposed requirements today, insofar as the mechanical installations are concerned.

The inert gas systems? There are a large number of tankers of large size today which have inert gas systems installed. I'm speaking there of tankers that we don't see very much in this country. These are tankers of 200,000 dwt and up which we don't see because, as I'm sure you're aware, they cannot enter our ports due to draft limitations.

Q. I want to go back to the "rust bucket" question. After the last run of disasters we heard that the United States generally, because of its small ports and other reasons, tends to get the older tankers bringing oil to it. Is it fair to say that these propusals will end that imbalance?

BENKERT. In the case of old small tankers which are on their last legs, the owners are not going to spend the money to retrofit them, and I would think that certainly some of these older vessels would be scrapped.

I think, personally, that the best answer to the older vessels, having possibly a need for greater maintenance and greater care, is the increased inspection and increased stringency of inspection and control of those vessels by their flag states, and in our case by the United States on vessels entering our ports. Of course, as you know, we are proceeding in this vein.

Q. Admiral, would it be possible for ships to avoid these regulations by heaving to far offshore and lightering the oil onto barges?

BENKERT. Yes, sir, technically it would, but that does two things. For one thing, it militates towards ensuring international action to achieve these vessel improvements so that it is not solely a United States unilateral imposition of requirements.

The other thing it does, in my opinion, is prompt us to look, for example, at our design and construction requirements and appraisals of small vessels and barges that operate in our own waters. We have had a number of studies going on, and we are in the process right now of developing what I would consider more stringent design and construction requirements for barges in our inland waters.

What you are saying is correct that there can be some avoidance of requirements if the requirements are those that are solely applicable within the navigable waters of the United States.

Q. Are you intending to extend this to smaller vessels and barges?

BENKERT. Not these particular requirements necessarily. But we are looking at design and construction requirements to give us a better degree of pollution prevention potential with barges. Concepts, for example, of double hull construction, phasing out of older barges, this sort of thing.

Q. Admiral, how much more will the Coast Guard need in the way of manpower to carry out these requirements? Where do the appropriations stand on this?

BENKERT. I'm not a financial expert but we have right now, I believe, commitments for 150 more people within the next 3 years, specifically to be trained and dedicated for this type of enforcement work which we are contemplating expanding, particularly as far as the foreign vessels in our waters are concerned. We do have right now a very highly qualified field force of personnel throughout our country in all of our major ports who are involved in this type of work on a day-in, day-out basis. Obviously, if we are going to expand our foreign-flag vessel inspection and examination efforts we would need some more people, and I think our budget, as I have mentioned, is being adjusted to take care of this. This is, I might say, a very important project and I think both the Department of Transportation and the Office of Management and Budget have looked at it in exactly that vein.

Q. You are only talking about oil vessels?

BENKERT. These proposals apply to oil tankers, yes, sir.

Q. I know there are a lot of problems all over the world and vessels spill a lot of, not only oil, but oil and water, because they have to pump from the bilge.

BENKERT. Are you talking of deballasting?

Q. Yes. And they spill much more oil and other pollutants than all the casualties that we have had so far.

BENKERT. You must understand that these requirements for segregated ballast are aimed at exactly that problem. And we do have, by international agreement in the Pollution Convention of 1973, a number of requirements which the United States is now enforcing, and which other countries will be enforcing in the near future, relative to the exact subject you are talking about, sir.

Q. Thank you.

BENKERT. Admiral Fugaro would probably like to say a few words.

FUGARO. I would like to add that one of these sets of regulations will be applicable to *all* vessels, including tankers and non-tankers—specifically the collision avoidance equipment and backup radar requirement. That will apply to all vessels of 10,000 gross tons or more. We predicated this on the fact that if we were trying to prevent collisions we had to put this equipment on all types of vessels that would be involved in collisions, not just tankers.

BENKERT. Thank you very much, ladies and gentlemen.

Proposed Tanker Regulations

The proposed rules discussed in the preceding article were published in the Federal Register for May 16, 1977.

Interested persons are invited to submit their comments on these proposals on or before November 15, 1977, to:

Commandant (G–CMC/81)
U.S. Coast Guard
Washington, D.C. 20590

Written comments should include the docket number [CGD 77–] found in the heading of the particular proposal being commented upon. All comments received will be considered before final action is taken.

DEPARTMENT OF TRANSPORTATION

Coast Guard

[33 CFR Part 157]

[CGD 77–058]

TANK VESSELS CARRYING OIL IN TRADE

Protection of Marine Environment

* * * * *

SUMMARY: The Coast Guard is considering amending the rules for the protection of the marine environment relating to tank vessels carrying oil in bulk by requiring all oil tankers of 20,000 tons deadweight (DWT) or more, U.S. and foreign, that call at American ports to have segregated ballast capabilities and that those built under a contract awarded after [December 31, 1979], or delivered after [December 31, 1981], have double bottoms. This amendment is in response to that portion of the President's March 17, 1977, message to Congress relating to double bottoms and segregated ballast on tankers over 20,000 tons DWT entering U.S. ports. The adoption of this amendment would result in reduced amounts of oil spillage into the navigable waters of the United States and oceans.

* * * * *

Discussion of the Proposed Regulations

The President's message of March 17, 1977, to Congress included measures designed to reduce oil pollution caused by tanker accidents and by routine operational discharges from all vessels. The President informed Congress that the Secretary of Transportation would be instructed to develop new rules within 60 days for all oil tankers 20,000 tons DWT or more, U.S. and foreign, that call at American ports. Included were rules for double bottoms in tankers built in the future and segregated ballast on all tankers. The proposal in this document is in response to the President's initiative.

The regulations would require a double bottom beneath the cargo carrying portion of a seagoing vessel's hull if the vessel is 20,000 tons DWT or more and is constructed under a contract awarded after [December 31, 1979] or if it is to be delivered after [December 31, 1981]. As authorized in the President's message, the Coast Guard may accept technological improvements or alternatives which will result in equivalent pollution protection in grounding accidents.

The regulations would also require that all seagoing vessels of 20,000 tons DWT or more have a segregated ballast capability by [January 1, 1982]. Again, provision is made for acceptance of technological improvements or alternatives which will result in equivalent pollution protection against operational discharges.

The regulations would apply to vessels over 20,000 tons DWT which enter the navigable waters of the United States to engage in trade.

It will be noted that implementation dates in this proposal are enclosed in brackets. This is to indicate that the dates are tentative and may be advanced or delayed by as much as one year, depending upon comments received and the outcome of current international negotiations directed at developing international standards of comparable scope.

This proposal has been reviewed for economic effects under Department of Transportation "Policies to

Improve Analysis and Review of Regulations" (41 FR 16200).

The analysis shows that allowing for some market compression, approximately 1250 foreign tank vessels and 220 U.S. seagoing tank vessels would be affected by the segregated ballast retrofit requirement. In addition, approximately 25 new double bottom tankers will have to be built in the United States to meet domestic shipping demands. The projected costs of the requirements to the U.S. seagoing transportation industry is estimated to be $77 million in the 2 year period, 1981 and 1982. Total added costs to be passed on to the U.S. consumer by way of higher freight rates is estimated to be $125 million annually.

The expected benefits of the requirements are reduced amounts of spillage of oil into the navigable water of the U.S. as a result of vessel groundings, reduced amounts of operational discharge to the oceans from deballasting and tank cleaning, and conservation of oil.

In consideration of the foregoing, it is proposed to amend Part 157 of Title 33, Code of Federal Regulations, as follows:

1. Section 157.07 is revised to read as follows:

§ 157.07 Equivalents.

The Coast Guard may accept, in accordance with the procedure in 46 CFR Part 30.15–1, technologically improved or alternate design or equipment as equivalent to a design or any equipment required under this part.

2. Section 157.10 is added to read as follows:

§ 157.10 Segregated ballast and double bottoms.

(a) After [December 31, 1981,] a vessel of 20,000 tons DWT or more must have segregated ballast tanks that have a total capacity to allow the vessel to meet the draft and trim requirements in paragraph (b) of this section without recourse to the use of oil tanks for water ballast.

(b) In any ballast condition during any part of a voyage, including that of lightweight with only segregated ballast, the vessel's drafts and trim must have the capability of meeting each of the following requirements.

(1) The molded draft amidship (dm) in meters without vessel deformation must not be less than dm in the following mathematical relationship:

$$dm = 2.0 + 0.02L$$

(2) The drafts at the forward and after perpendiculars must correspond to those determined by the draft amidship as specified in paragraph (b) (1) of this section, in association with trim by the stern of no more than 0.015L.

(3) The minimum allowable draft at the after perpendicular is that which is necessary to obtain full immersion of the propeller.

(c) A vessel may have pollution protection against operational discharges equivalent to paragraph (b) of this section that is accepted under § 157.07.

(d) The vessel may be designed to carry ballast water in cargo tanks during the condition described in § 157.35.

(e) A vessel of 20,000 tons DWT or more for which the construction contract is awarded after [December 31, 1979] or which is delivered after [December 31, 1981] must—

(1) Have a double bottom that does not carry oil and that is at least the molded breadth divided by fifteen (B/15) or two meters in height, whichever is less, under each oil cargo tank, or

(2) Have pollution protection against groundings equivalent to paragraph (c) (1) of this section that is accepted under § 157.07.

(f) Any excess capacity of segregated ballast under paragraph (b) of this section that exceeds the double bottom capacity must be distributed adjacent to the side shell of the vessel.

3. Subpart B is amended by adding § 157.24a to read as follows:

§ 157.24a Submission of segregated ballast calculations.

After [December 31, 1981,] the owner of a vessel under § 157.10(b) shall submit the following to the Coast Guard before that vessel enters the navigable water of the United States:

(a) Calculations to substantiate compliance with the segregated ballast distribution requirements in § 157.10(b).

(b) Plans and specifications for the vessel that include—

(1) Design characteristics;

(2) A lines plan;

(3) Curves of form (hydrostatic curves) or hydrostatic tables;

(4) A general arrangement plan of each deck and level;

(5) Inboard and outboard profile plans showing oiltight and watertight bulkheads;

(6) A midship section plan;

(7) A capacity plan showing the capacity and the vertical and longitudinal centers of gravity of each cargo space, tank, and similar space;

(8) Tank sounding tables or tank capacity tables;

(9) Draft mark locations;

(10) Detailed plans of watertight doors; and

(11) Detailed plans of vents.

(c) A certified statement accepting the design of the vessel by the classification society that oversees the vessel if that design meets the classification society's rules and the requirements of § 157.10.

(Title II, Sec. 201, 86 Stat. 427, as amended (46 U.S.C. 391a); 49 CFR 1.46(n)(4))

NOTE.—The Coast Guard has determined that this document contains a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended, and OMB Circular A–107 and certifies that an Economic Impact Statement has been prepared.

Dated: May 6, 1977.

O. W. SILER,
Admiral, U.S. Coast Guard,
Commandant.

[33 CFR Part 157]

[CGD 77-063]

IMPROVED EMERGENCY STEERING STANDARDS FOR OIL TANKERS

* * * * *

SUMMARY: The Coast Guard is proposing to amend the rules for the protection of the marine environment relating to tank vessels carrying oil in bulk by requiring improved emergency steering standards for all oil tankers of 20,000 deadweight tons 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 tanker accident. The President's message directed that the standards in this proposal and other regulations would be developed. Adoption of the regulations in this proposal would reduce the probability of collision and grounding of oil tankers 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.

* * * * *

Discussion of the Proposed Regulations

1. The President's message of March 17, 1977, to Congress included initiatives designed to reduce oil pollution caused by tanker accidents and by routine operational discharges from all vessels. The President informed Congress that the Secretary of Transportation would be instructed to develop new rules within 60 days for all oil tankers of 20,000 deadweight tons or more, both U.S. and foreign, that call at U.S. ports. Included were rules to improve emergency steering standards on oil tankers. The proposal in this document is in response to the President's initiative.

2. As provided in the President's message, acceptance of technological improvements or alternatives which will result in equivalent pollution protection will be allowed in lieu of the equipment proposed in this notice. Procedures for acceptance of equivalents are currently contained in § 157.07 of Part 157. Section 157.07 is being revised in accordance with the President's commitment and is contained as a proposal in the "Proposed Rules for Tank Vessels Carrying Oil in Trade", which appears in this issue of the Federal Register.

3. Sufficient time is needed for existing and new vessels to comply with the equipment requirements in these proposals and to develop operating procedures with respect to using the equipment. Accordingly, the effective date proposed for the regulations is one year after they are published as final rules.

4. The proposed regulations would apply to all oil tankers of 20,000 deadweight tons or more that call at U.S. ports. The purpose of the proposed regulations is to reduce the probability of collision or grounding of oil tankers caused by a steering failure. A reduction in the probability of these accidents would reduce the risk of oil pollution as well as property damage, personal injury, and death that could result from these accidents.

A Coast Guard review of vessel casualty reports shows that 87 casualties involving failure of steering gear or a steering gear control system were reported between 1963 and 1976 on tank vessels of 20,000 deadweight tons and over. Forty of these casualties occurred on foreign vessels operating in U.S. navigable waters and the remaining casualties occurred on U.S. vessels. Though no deaths or pollution incidents were reported as a result of these casualties, vessel damage and other property damage occurred and the potential of pollution resulting from collision or grounding was present in each casualty. The potential for collision or grounding and subsequent pollution as a result of steering failure cannot be ignored when considering the increasing number of vessels being used to transport oil in bulk.

5. In addition to the proposals in this notice, the Coast Guard is preparing proposed amendments to Subchapter J of Title 46, Code of Federal Regulations, that in part contain provisions for steering gear power and control systems on new U.S. vessels. The proposals in Subchapter J are based upon the recommendations for steering gear power and control systems contained in International Maritime Consultative Organization (IMCO) Resolution A.325 (IX) entitled "Recommendations Concerning Regulations for Machinery and Electrical Installations in Passenger and Cargo Ships." IMCO Resolution A.325 (IX) was adopted by the IMCO Assembly on November 12, 1975.

6. The Coast Guard recognizes that problems of steering failure are not limited to oil tankers and in the future will be considering proposals to make the rules in this notice applicable to other tank vessels as well as to other types of vessels.

7. The proposals in this notice contain requirements for steering failure alarms, requirements for recovering rudder control after failure of a steering gear control system, and requirements for submitting steering control information to the Coast Guard and in certain cases for retaining the information on board the vessel.

8. Section 157.03(aa) contains a definition of "steering gear control system" as the term is used in the proposed regulations. This definition will also appear in the proposed amendments to Subchapter J of Title 46 that are currently being prepared. The definition would include a differential control unit as a component of a steering gear control system. Accordingly, on an existing vessel that utilizes a common differential control unit for its steering gear control systems, an additional differential control unit would be required in order to comply with the requirement in § 157.20(a),

which requires the capability to recover rudder control after a failure in the steering gear control system in use. If the failure occurred in the differential control unit, a second unit would be needed in order to assure recovery of rudder control.

9. Proposed § 157.20 requires each oil tanker of 20,000 deadweight tons or more to have a steering failure alarm that would provide an audible and visible warning in the pilothouse in the event of loss of rudder control from the pilot house. The 5 degree position variation and 30 second time period proposed in this requirement are necessary to prevent nuisance alarms caused by normal variation between the rudder position ordered and the actual rudder position.

Proposed § 157.20 applies only to a vessel that has a steering gear control system of the type required by 46 CFR 58.25–45(a). Section 58.25–45 (a) of Title 46 in part requires that the arrangement of the steering gear control system and the steering gear components must provide full follow-up control of the rudder. If the vessel is steered by other means, 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 either event, early warning of a steering failure is provided when using these other means of steering without the need of an additional warning.

Proposed § 157.20 also requires the proposed alarm system to be separate from and independent of each steering gear control system on the vessel. The purpose of providing separate arrangement of the alarm system is to minimize the probability of simultaneous damage to both the alarm system and a steering gear control system from a source external to these systems. The alarm system must be independent of each steering gear control system so that failure of a component of a steering gear control system will not result in failure of the alarm.

10. Proposed § 157.20a requires 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. The proposed 45 second time limit is needed to perform necessary operations to regain steering control such as transferring control switches, shifting hydraulic systems, and engaging a trick wheel.

Paragraph (b) of § 157.20a describes the measure of rudder control that must be recovered after failure of a steering gear control system. This capability is the same as the capability recommended in IMCO Resolution A.325 (IX) for operation of auxiliary steering gear.

In order to comply with proposed § 157.20a, equipment modifications to present steering gear control systems on vessels may be necessary though in many instances vessel operators could elect to provide manning of steering stations in lieu of making equipment modifications.

11. Proposed § 157.24b provides that in the case of a U.S. vessel information showing compliance with the proposed alarm and rudder control requirements must be submitted to the Coast Guard. The proposal also provides that in the case of a foreign vessel this information must be on board whenever the vessel operates in the navigable waters of the United States.

12. Proposed § 157.51 contains a requirement to follow the procedure in § 157.20a for recovering rudder control.

13. This proposal has been reviewed for economic effects under Department of Transportation "Policies to Improve Analysis and Review of Regulations" (41 FR 16200). Approximately 1800 oil tankers of 20,000 deadweight tons or more call at U.S. ports. The total costs for these vessels to comply with the requirements proposed in this notice during the first two years after they become effective are expected to be approximately $16,575,000. The estimated costs to U.S. vessels during the first two years are expected to be $820,000 to install steering failure alarm systems and $3,100,000 to comply with the requirement to recover steering control. The remaining costs would be associated with foreign vessels. The total, estimated costs assume that approximately 50 percent of the affected vessels would comply with the requirements by means of manning of steering stations other than the pilothouse.

Compliance with the proposed requirements should result in fewer groundings and collisions and in a corresponding reduction in probability of pollution, property damage, injury, and death.

In consideration of the foregoing, it is proposed to amend Part 157 of Title 33, Code of Federal Regulations, as follows:

1. Section 157.03(aa) is added to read as follows:

§ 157.03 Definitions.

* * * * *

(aa) "Steering gear control system" means a group of devices and cables forming a network that regulates and guides the operation of a steering gear.

2. Section 157.20 is added to read as follows:

§ 157.20 Steering failure alarm.

(a) This section applies to each vessel of 20,000 deadweight tons or more that has a steering gear control system of the type required by 46 CFR 58.25–45.

(b) Each vessel must have an alarm system that activates an alarm in the pilothouse whenever the actual rudder position differs for thirty or more seconds by more than five degrees from the rudder position selected by the helmsman.

(c) The alarm system must be separate from and independent of each steering gear control system, except that the alarm system may receive input from the steering wheel shaft.

(d) The alarm must be both audible and visual and must be of a type

distinctive from each other alarm in the pilothouse.

NOTE.—This section becomes effective one year after the final regulations are published.

3. Section 157.20a is added to read as follows:

§ 157.20a Recovery of rudder control.

(a) Each vessel of 20,000 deadweight tons or more that calls at a U.S. port must have equipment and procedures to recover adequate control of the rudder within 45 seconds after a failure in the steering gear control system in use has been detected.

(b) A vessel meets the requirements in paragraph (a) of this section if it has either of the following combinations of procedures and equipment, although other combinations are possible:

(1) Two separate and independent steering gear control systems, associated equipment in the pilothouse for switching from one system to another, and procedures for operating the associated equipment.

(2) Procedures and associated equipment for manning steering gear spaces and emergency steering stations, as necessary, which ensure compliance with the requirement in paragraph (a) for recovering rudder control.

(c) For the purposes of this section, adequate control of the rudder is recovered if the vessel regains the capability to move the rudder from 15 degrees on one side to 15 degrees on the other side in not more than 60 seconds, when the vessel is underway at its deepest draft and at one half of its maximum speed ahead or 7 knots, whichever is greater.

NOTE.—This section becomes effective one year after the final regulations are published.

4. Section 157.24b is added to read as follows:

§ 157.24b Submission of steering control information.

(a) The owner of a U.S. vessel of 20,000 deadweight tons or more shall submit the following information to the Coast Guard before the vessel operates in the navigable waters of the United States.

(1) Plans and specifications of the steering failure alarm system required by § 157.20 that contain enough detail to show compliance with that section.

(2) Plans, specifications, and procedures that contain enough detail to show compliance with the requirements in § 157.20a for regaining rudder control.

(b) The owner of each foreign vessel of 20,000 deadweight tons or more that calls at a U.S. port shall have on board the information described in paragraph (a) of this section whenever operating in the navigable waters of the United States.

NOTE.—This section becomes effective one year after the final regulations are published.

5. Section 157.51 is added to read as follows:

§ 157.51 Procedures for recovery of rudder control.

The master of a vessel of 20,000 deadweight tons or more that calls at a U.S. port must ensure that the procedures required by 157.20a for recovering rudder control are followed whenever the vessel is operating on the navigable waters of the United States.

(Title II, sec. 201, 86 Stat. 427, as amended (46 U.S.C. 391a); 49 CFR 1.46.)

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.

Dated: May 9, 1977.

O. W. SILER,
Admiral, U.S. Coast Guard,
Commandant.

[33 CFR Part 164]

[CGD 77-016]

VESSELS OF 10,000 GROSS TONS OR MORE

Proposed Additional Equipment

* * * * *

SUMMARY: The Coast Guard is considering amending the Navigation Safety Regulations by adding a requirement for vessels of 10,000 gross tons or more, both U.S. and foreign vessels calling at United States ports, to have a second radar system and collision avoidance equipment. This amendment could implement that part of the President's March 17, 1977, message to Congress concerning a requirement for backup radar systems with collision avoidance equipment on all tankers over 20,000 deadweight tons (dwt) entering U.S. ports. The adoption of this amendment could result in tangible savings for industry and government including less vessel damage or loss, and lower investigation, search and rescue, and pollution clean-up costs.

* * * * *

DISCUSSION OF THE PROPOSED REGULATIONS

An advance notice of proposed rulemaking entitled "Marine Traffic Requirements" was published in the FEDERAL REGISTER on June 28, 1974 (39 FR 24157). Among the many concepts advanced were proposals to require a second radar and an "anti collision device" on all vessels of more than 10,000 gross tons operating on the navigable waters of the U.S. Three commenters responded negatively regarding the second radar, primarily because of the retrofit costs. Four commenters responded negatively concerning the "anti collision device". They stated that: (1) the variety of such devices is so great as to make compliance difficult without "tighter" specifications; and (2) the collision avoidance capability of those devices is based on a presumed steady state of relative motion between vessels—a condition which rarely prevails on inland waters.

Navigation Safety Regulations were proposed in the May 6, 1976, issue of the FEDERAL REGISTER (41

FR 18766). The proposed requirement for a second marine radar system was retained despite the three negative comments. In the Coast Guard's view, loss of radar capability on a vessel of 10,000 gross tons or more imposes an unacceptable risk factor. Redundancy was deemed necessary for safety. However, the proposed requirement for a collision avoidance system was dropped in light of the comments mentioned above.

Fifteen commenters responded to the proposed second radar requirement. Five suggested that we further specify one 3-cm and on 10-cm radar. Four requested additional specifications, such as stabilization, PPI scope size, mode of presentation, and reflection plotter. Six comments were negative, again citing retrofit costs, limited usefulness in confined waters, and complaining of "useless" redundancy.

The June 30, 1974, Advance Notice of Proposed Rulemaking proposed a requirement for both 3-cm and 10-cm radars. The Notice of Proposed Rulemaking of May 6, 1976, did not specify wavelengths. Generally speaking, the longer wavelength radar gives better adverse-weather performance because of its ability to penetrate water droplets. This advantage is gained at the cost of resolution. The signal of the shorter wavelength radar is attenuated more by moisture, but it gives better resolution in good weather. A requirement for a second radar could be based either on a perceived need for operational flexibility or on a need for redundancy. Operational flexibility, the Coast Guard feels, is best left to the vessel operator. The objective of this proposal is to provide, for certain vessels, a degree of radar redundancy and to provide for installation of a collision avoidance device on those vessels.

Seventeen commenters objected to the removal of the proposed requirement for a collision avoidance system. For the most part, the arguments advanced were not persuasive. However, the volume of comments suggested that further study was warranted.

Navigation Safety Regulations (33 CFR 164) were published in the FEDERAL REGISTER (42 FR 5956) as a final rule on January 31, 1977. The regulation did not include a requirement for collision avoidance systems, citing instead the planned issuance of this notice. The proposed requirement for a second radar system was not included pending resolution of the question of collision avoidance system.

On March 17, 1977, President Carter conveyed to Congress a message concerning oil spill risk. In it he directed several initiatives, including the development within 60 days of certain regulations, including "Backup radar systems, including collision avoidance equipment, on all tankers [over 20,000 deadweight tons]". This notice is directly responsive to that mandate. The 10,000 gross ton criteria listed in the advance and proposed notices of rulemaking is (as to tankers) roughly comparable to the 20,000 deadweight tons specified in the President's initiatives of March 17, 1977. As collisions between vessels are not related to their cargo or trade, it was determined that the proposed requirement for a second marine radar and a collision avoidance system should apply to all vessels of 10,000 gross tons or more.

As noted above, the May 6, 1976, notice proposed a requirement for a second marine radar system on all vessels of 10,000 gross tons or more. That requirement was withheld from the final rulemaking in anticipation of this proposal that a collision avoidance system be installed on those same vessels. Some collision avoidance systems have a radar display, actual or synthetic, integrated into the system. Others "add on" to the basic radar system. Delaying implementation of the second radar requirement until a decision is made on possible requirement of a collision avoidance system will allow the ship owner maximum flexibility in compliance.

A collision avoidance system is designed basically to aid mariners in identifying and resolving vessel relative motion problems. Just as a pocket calculator replaces paper and pencil in arithmetic computations, the basic collision avoidance system replaces manual maneuvering board solutions. Experience and good judgment are still the determining factors in safe navigation, with or without a collision avoidance system.

As has been pointed out by several commenters, electronic resolution of the threat posed by closing contacts is far faster than manual methods and does not distract the "conning" officer from other functions. Moreover, an electronic system can handle simultaneously more contacts than a manual system, thus to a point eliminating the problem of saturation by multiple contacts. Additionally, the system can be designed to give warning of closing contacts and to operate in a "trial maneuver" mode to predict the outcome of various responses. This "trial maneuver" capability is entirely dependent upon a steady state of relative motion between vessels. This predicted outcome can be negated by a change of target course or speed. Single or few contacts may be adequately handled by manual methods using a plotter. However, these manual methods do not favorably compare in speed of solution or convenience of data presentation with the computer assisted systems.

The U.S. Maritime Administration requires that collision avoidance systems be installed on all new construction tankers subsidized by that agency and recommends that they be installed on all subsidized vessels engaged in foreign trade. A study by the National Research Council, entitled "Human Error in Merchant Marine Safety", published in June 1976, recommends that the systems be required on oceangoing merchant vessels to reduce human error casualties stemming from lack of vigilance. A report of recent British investiga-

tions indicates that collision avoidance systems decrease workload and increase operator understanding of the situation around his ship. Conversely, a recent study by Operations Research, Inc., of Silver Spring, Md., commissioned by the Coast Guard, concludes in part that requiring the systems would not appear to be cost-beneficial in preventing vessel casualties on the navigable waters of the U.S.

The Coast Guard has determined that a collision avoidance system in each vessel of 10,000 gross tons or more could contribute positively to the safety of that vessel and to the protection of the environment, particularly in waters in which vessels are not closely confined and are not making repeated course changes dictated by geographic or other conditions.

Economic impact. This proposal has been reviewed for economic effects under Department of Transportation "Policies to Improve Analysis and Review of Regulations" (41 FR 16200). It is estimated that 2,000 foreign and 400 U.S. vessels might be affected if the proposal is adopted. Basic collision avoidance systems range in price from $90,000 to $150,000. At an average cost of $120,000 per vessel, installed, the projected first year cost to the U.S. shipping industry would be $43,200,000 and the impact on the U.S. economy would approximate $76,800,000. Assuming a 10 year amortization period, the second through tenth year impacts would be about $28,800,000 per year. Impact on the U.S. economy would total $307,200,000 over the 10 year period.

The benefits from having this equipment could result in tangible savings, including less vessel damage or loss, less post-vessel-casualty costs, including investigation costs, and search and rescue costs, and less pollution clean up costs. Significant intangible benefits could accrue, including less loss of life or injury and less pollution and resulting harm to the environment.

If adopted, the final regulations would contain a specific effective date on which collision avoidance systems would be required to be onboard vessels of 10,000 gross tons or more while operating on the navigable waters of the U.S. This effective date would follow by one year the publication of the final regulations in order to allow sufficient time for the procurement and installation of the required equipment.

Accordingly, it is proposed to add § 164.37, to Part 164, published in the January 31, 1977, issue of the FEDERAL REGISTER (42 FR 5969), to read as follows:

§ 164.37 Additional 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 required in § 164.35 (a), a second marine radar system with a computer aided collision avoidance system meeting the specification entitled "Performance Specification For a Computer Aided Collision Avoidance System For Merchant Ships", published by the Radio Technical Commission for Marine Services (RTCM Paper 171–76/EC 205/SC 65–226, Revised January 19, 1977).

NOTE.—Performance Specification for a Computer Aided Collision Avoidance System for Merchant Ships is published in Appendix A for reader's convenience.

(Titles I and II, 86 Stat. 426, 427 (33 USC 1224; 46 USC 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.

O. W. SILER,
Admiral, U.S. Coast Guard, Commandant.

MAY 9, 1977.

APPENDIX A—PERFORMANCE SPECIFICATION FOR COMPUTER AIDED COLLISION AVOIDANCE SYSTEM FOR MERCHANT SHIPS

NOTE: Published by the Radio Technical Commission for Marine Services (RTCM), under the Federal Communications Commission, as RTCM Paper 171–76/EC–205/SC 65–226 (revised as of January 19, 1977 and superseding Paper 145–76/SC 65–220).

1. Purpose. The purpose of this document is to specify minimum performance standards for a computer-aided collision avoidance system to assist in correctly interpreting radar data in a manner that will help avoid collisions.

2. Scope. This document provides specifications for the capabilities, data presentation, warning features and necessary inputs of a shipboard computer-aided collision avoidance system, suitable for use on board merchant ships.

3. Inputs to the system. The system shall be capable of accepting signals from the ship's radar(s), gyro compass, speed log (or equivalent speed input), and from a manual speed input. The system shall clearly indicate the speed source selected. The system, whether operating normally or having failed, must not introduce any spurious signals or otherwise degrade the performance of the equipments providing inputs.

4. PPI display. The effective size of the PPI display shall be equivalent to or greater than that provided by a 16" diameter CRT.

The display may be separate or it may be a ship's radar PPI with the collision avoidance data superimposed.

The system shall have both true and relative [1] presentation modes. As a minimum, a capability for relative motion display shall be provided. Projected target track lines should be selectable in either true or relative

[1] A course-up presentation is an acceptable variation of the relative presentation.

motion. [2] In addition, the system may provide for true motion. If true motion is provided, the operator shall be able to select for his display either true or relative motion.

Computer generated data for each displayed target shall be in the form of a vector or line indicating target true course or relative motion, with a length proportional to speed, giving both present and extrapolated future positions. The capability to cancel the line or vector presentation of nonthreatening targets shall be provided.

The display presentation may be entirely synthetic or synthetics superimposed on the radar video. If the display is superimposed on radar video, means shall be provided to independently adjust the brilliance of the synthetic presentation and of the radar video, including their complete elimination.

Own ship's heading indicator shall be presented on the display in all modes. The indicator shall appear on the display either as a heading line or as a heading marker on the periphery, and shall be accurate within 0.5 degree exclusive of sensor errors. Provision shall be made for adjusting its brilliance and for momentary extinguishing of the heading line. A bearing ring which may be movable shall also be provided.

The system shall be capable of simultaneously representing fixed targets, moving targets and land masses.

The equipment should be provided with at least four range scales, the smallest of which is not more than 3 nautical miles (nm) and the greatest of which is not less than 24 nm.

The brilliance of the display shall be adjustable to the level where it is sufficiently bright to be observed in the normal ambient sunlight expected in a wheelhouse, without the use of a hood, except that a shield may be provided to block direct rays of the sun. The display shall be usable without destroying night vision on a darkened bridge. To enable night vision protection, the display phosphor shall include wavelengths within the band 600 to 750 nanometers, in order to permit the use, where desired, of a red filter. A red phosphor that emits solely within the 600 to 750 nanometer band is an acceptable alternative to the red filter.

For targets having a range of less than 10 miles, within one minute after the moment that:

(a) The target appears on the radar display and is within the acquisition range of the collision avoidance system (for automatic acquisition systems), or

(b) The operator initiates acquisition (for manual acquisition systems), the system should present, as a minimum, an indication of target motion trend. Within 3 minutes a fully accurate target course and speed should be presented on the display and/or in alphanumeric form, assuming the associated radar has a scanning rate of at least once in three seconds. If more than two targets on the same bearing are required, the above presentation times may be degraded. This degradation factor must be restricted to a maximum of two times the above limits for a quantity of four targets on the same bearing and three times for a quantity of six targets on the same bearing, etc.

5. Target acquisition. Target acquisition may be manual or automatic. The system shall be able to track at least (20) targets automatically. The tracked targets shall be marked on the display by distinct tracking symbols.

6. Warning alarms. For a manual acquisition system, audio and visual alarms shall be initiated by any target closing to a preset minimum range, or guard ring. After target acquisition, similar alarms shall be initiated in all systems by any target that is predicted to close to less than a preset minimum range. The target causing the alarms to be initiated shall be clearly identifiable on the display.

For both manual and automatic acquisition systems, means shall be provided to silence the audio alarm for a given threat but the alarm shall resound upon a subsequent threat. A visual indication shall continue until all threats have been eliminated.

7. Alpha-numeric information presentation. For any acquired target, where alpha-numeric information is provided, the following shall, as a minimum be included:

Present range to the target;

Present bearing of the target;

Predicted target range at the closest point of approach (CPA);

Predicted time to CPA (TCPA);

Present course of the target;

Present speed of the target.

This information may be presented on the system display or on a separate display device.

When steady-state tracking conditions have been obtained for a nonmaneuvering target, the computational errors introduced by the collision avoidance device shall be no greater, for the parameter under consideration, than the unit value of the least significant digit displayed of that parameter.

8. Accuracy. Operationally the equipment is required to present data on a target of interest with adequate accuracy in a reasonable time. Equipment which can satisfy the following test condition will be deemed to meet this requirement.

For a vessel on a constant collision course at a range of 4 nm, with a relative speed of 20 knots, the equipment shall determine the relative speed to within 10 percent within 3 minutes from the time of acquisition. Further, for a vessel passing 1 nm ahead with a relative speed of 10 knots and a constant direction of relative motion (DRM) of 090°, the equipment

[2] For those Collision Avoidance Systems utilizing a combination vector/predicted area of danger (PAD) assessment presentation, projected target track lines may be either true or relative.

shall determine its DRM to within 3 degrees in the same time period.

The above requirements pertain to computational accuracy of the system and do not encompass the inaccuracies of the input sensors.

9. Trial maneuver. The system is to provide necessary information regarding possible maneuvers in order to avoid collisions. The system shall have the capability of simulating possible future situations and presenting such situations on the display. The trial maneuver shall indicate the results of a simulated course change. It may indicate, in addition, the result of a simulated speed change or of a speed change in conjunction with a course change. The simulation shall be initiated by the depression either of a spring-loaded switch or of a function key with a positive identification on the display. The indication of the simulation shall be deleted and the display shall revert to normal operation either by the release of the spring-loaded switch, or after the lapse of a present time not to exceed one minute in the case of the function key. During a simulation the system shall activate warning alarms related to the real traffic situation.

10. Environmental conditions. The Collision Avoidance System, including all components shall be capable of operating in the environment normally found on the bridge and/or associated areas. Requirements as specified in Appendix A shall be used as the minimum required to meet the intent of this specification.

11. Compass-Safe Distances. System units must operate with no effect on the standard magnetic or steering magnetic compass when positioned no closer than the manufacturers specified "Compass Safe Distance".

12. Power supply. The system shall be capable of normal operation when encountering the following variations:

	Percent
AC variations from nameplate voltage	±10
Variations from nameplate frequency	±6
DC variations from nameplate voltage:	
110–250V	−20+10
24–32V	−10+25

The equipment shall have impulse voltage transient protection from pulse transients with amplitudes of ±1200 peak volts, rise times of 2 usec to 10 usec, and durations up to 20 usec.

13. Failure alarms, suitable visual and audio alarms shall be provided to alert the operator in the event of overall system failure, loss of incoming sensor signals (radar, gyro and speed log) or any other failure detected by the system's self-test capabilities. These alarms shall be in the form of flashing lights, repeating sound signals or some other method to alert the watch officer when the equipment is unattended. Provision shall be made to silence the audio alarm but visual signals shall remain until the failure is corrected, reset by the operator, or the system shut down.

14. Recording capability. Continuous recording capability of not less than one half hour, of the collision avoidance data to reproduce the display(s) may be provided. Such recording shall be capable of being started and stopped "at will" at the display. Provision shall be made to save the data, when desired, for playback through a suitable device.

[CGD 77-057]

[46 CFR Parts 30, 32]

INERT GAS SYSTEM

Proposed Amendment

* * * * *

SUMMARY: This document proposes to extend the inerting system requirements from tank vessels of 100,000 deadweight tons (dwt) or more to tank vessels of 20,000 dwt or more. This proposal is in response to that part of the President's March 17, 1977, message to Congress concerning a requirement for inert gas systems on all U.S. and foreign flag oil tankers of 20,000 dwt calling at American ports. If the systems are installed, there should be a reduction in the number of in-tank explosions on board tankers.

* * * * *

Discussion of Proposal

On January 26, 1976, the Coast Guard published regulations in the Federal Register (41 FR 3838) concerning tank vessel fire protection that incorporated the substance of IMCO Resolution A.271 (VIII), adopted by the Assembly of the Inter-Governmental Maritime Consultative Organization on November 20, 1973. These regulations contain provisions that increase the overall level of safety of tank vessels. One of the provisions of this rulemaking was the requirement that inert gas systems be fitted on new tank vessels of 100,000 dwt or more and combination carriers of 50,000 dwt or more. In the preamble of that document, the Coast Guard made a commitment to reexamine the international recommendations concerning the implementation limits for inert gas systems. That reexamination is reflected in this proposal.

In order to detail the rationale for this proposal, it is necessary to review the history and development of the original decision, the intervening events which have influenced that decision, and the action taken in the international forum

In 1968, a working group was formed as part of the IMCO Subcommittee on Fire Protection. The purpose of this group was to develop a series of international recommendations to improve tank vessel fire safety. This effort was initiated by the United States through both formal and informal channels within the IMCO forum. The work was divided into two primary areas of concern: protection for the cargo tank area; and protection for the accommodation and service spaces.

After considerable debate, the working group accepted the premise

that the accommodations and service spaces should utilize the concept of non-combustible construction, a practice successfully employed in U.S.-flag tank vessels for many years.

During the deliberations concerning the recommendations for cargo tank protection, three very large crude carriers (VLCC's), the *Mactra, Marpessa,* and the *Hong Haakong* suffered tank explosions, adding a new dimension to the considerations. The similarity between the casualties led several countries to propose requirements related only to the potential problem of in-tank fires and explosions. U.S. requirements protected against in-tank explosions by preventative techniques and required the fitting of a deck foam firefighting system to mitigate on deck or in-tank fires. This position was the basis for the deliberations.

Owners, operators, and assurers were deeply concerned about the unexplained loss of the VLCC's. This concern resulted in a collective research effort which attempted to determine the causative factors involved in the explosions. The area of greatest concentration centered around tank cleaning methods and techniques. The investigation produced significant results in that tank cleaning methods were found to cause an increase in static electricity generation within the tank itself, thereby serving as a potential source of ignition.

As a result of the inability to determine the exact causes of the problem, several steps were taken to attempt to minimize the possibility of recurrence. On a voluntary basis, owners and operators were invited to utilize the International Chamber of Shipping, "Guidelines for Tank Washing," which were operational steps taken to minimize static electricity generation. The IMCO Assembly proposed a convention amendment (IMCO Res. A.271 (VIII)), "Fire Safety Measures for New Tank Vessels," which until adopted was issued as an interim recommendation. Emphasizing its high priority, all countries were urged by the Assembly to bring the recommendation into force on July 1, 1974 on a voluntary basis. In the intervening time period, an additional Assembly recommendation (IMCO Res. A.326 (IX)), was developed which requires cargo tank protection for vessels that was not as stringent as the previous document. The new recommendation required the fitting of a deck foam system with an augmented foam storage supply if an inert gas system was not fitted. During subsequent deliberations, numerous proposals were presented to require the fitting of inert gas systems for vessels of different sizes under IMCO Res. A.271 (VIII). Proposals ranged from a different tonnage cutoff point to a proposal that concerned the capacity of fixed tank vessel washing machines.

As a result of the explosions aboard the VLCC's, the use of inert gas systems on these vessels increased significantly throughout the world. During this time period, detailed experience was gained concerning the operation, maintenance and reliability of the system. This information indicated that—

1. There were certain hazards associated with the fitting and use of inert gas systems; and

2. Their reliability had a direct link to the maintenance of the system.

It was found that the inert gas systems (IGS) which were designed to provide protection during the hazardous tank washing process were, in fact, generators of static electricity themselves. In fact, the IGS systems were capable of generating more static electricity than the tank washing machines. In the second instance, the Norwegian Classification Society, Det Norske Veritas determined that approximately 70% of the systems inspected had major maintenance problems that could have seriously affected their use and reliability. Detailed maintenance and operation requirements for this type of system will be the subject of a future proposal in the FEDERAL REGISTER.

After the publication of the substance of IMCO Res. A.271 (VIII) into Subpart 32.53, the problem of tank vessel explosions caused by external sources of ignition was examined in further detail by the Coast Guard which noted that normal tank vessel operation would permit the tank of a vessel to be within the explosive range during loading, transit, and off loading in some cases.

The fact that this condition exists or can exist is known by both designers and operators. In order to prevent ignition of the flammable atmosphere, a U.S.-flag tank vessel must meet specific design and operational requirements:

1. The cargo tank block is classed as a hazardous area and sources of ignition are controlled by mandating explosion proof equipment, prohibition of smoking, and no open flaming devices.

2. Flame screens are required to be fitted in openings into cargo storage tanks and specific operational procedures are prescribed to protect the vessel from ignition sources.

3. Vents are required to be eqnipped with pressure vacuum valves for Grades A–C cargoes.

4. Cargo discharge and loading is required to be conducted under the supervision of ships' officers and certificated tankermen.

All of these provisions are directed at minimizing the potential for tank vessel fire and explosion. The casualties summarized in the following paragraphs indicate that casualties will occur despite the required safety systems.

For a variety of reasons design and operational requirements have not proven completely successful. The *Corinthos* and *Elias* were conventional tank vessels. For fire safety in the cargo area, they depended basically on identification of, and protection from, potential ignition sources. This protection, however, was not suf-

ficiently comprehensive and when an ignition source, which was not provided for, ignited flammable vapors in the cargo tank, an explosion was initiated. In each case, this explosion then progressed unchecked through the entire cargo tank area. Due to the fact that each vessel was unloading or had just completed off loading, some portion of the vapor space of all cargo tanks was in the flammable range and was, therefore, vulnerable to explosion, when an ignition source developed.

Loss of the Tanker "Corinthos"

On January 31, 1975, the U.S.-flag chemical tanker *Edgar M. Queeny* struck the outboard side of the moored 54,000 dwt Liberian flag crude carrier *Corinthos*. A low order explosion immediately resulted within the breached cargo tank and was followed within seconds by a series of increasingly more violent explosions. The explosions spread from tank to tank and the entire deck area of *Corinthos* was soon engulfed in flames and as a result, the vessel broke and sank alongside the British Petroleum dock No. 1, Marcus Hook, PA. Twenty-six persons were killed. Intense firefighting efforts were required for at least 12 hours after the first explosion.

Loss of the Tanker "Elias"

On April 9, 1974, the 30,000 dwt Greek flag tanker *Elias* suffered massive multiple explosions, burned, and sank in the Delaware River alongside the Atlantic Richfield Oil Terminal, Fort Mifflin, PA. At the time of accident, the vessel was in the last stages of off loading a cargo of crude oil from the Bachaquero field in Venezuela. A total of 13 persons aboard the vessel (including all principals involved in cargo transfer) were killed. The hull of the vessel came to rest in an upright position on the river bottom. The ensuing fire was fought from the shore by units of the Philadelphia Fire Department and from the water side by units of the U.S. Navy, U.S. Coast Guard, and commercial tugs. Over 30 firefighting and support units were involved at the height of the fire.

In both cases the exact ignition source remains unknown. An ignition source somehow reached the flammable vapors within the cargo tanks. The explosion then progressed through the other cargo tanks on the vessel. Total losses will probably exceed $25,000,000.

Tankers 20,000 dwt or More: Worldwide Casualties

In the period between 1950 and 1973, there were an estimated 515 fires and explosions on board vessels that occurred either in the cargo tanks or outside the tanks. This figure excludes fires and explosions in the engine spaces. Of that 515, approximately 243 (47%) occurred inside the cargo tanks. Those vessels that were 20,000 dwt or more had over 50% of the intank fires and explosions. The following table is for the period 1950–1973.

	Total number	Percentage
Vessel fires and explosions	515	100
Cargo tank fire and explosions	243	47
Casualtics on tankers 20,000 dwt or more	130	53

Benefits Accrued

As indicated in a preceding paragraph, the requirement for inert gas systems, as recommended in IMCO Resolution A.271 (VIII), developed as a result of the necessity to protect tank vessels of certain sizes during tank cleaning operations. This represents a relatively small portion of a tank vessel's life cycle. The benefits derived from inert gas systems are not limited to this time period. For example:

1. A tank which is inerted cannot sustain an in-tank explosion if the boundaries of the tank are intact. This provides assurance against in-tank explosions during other periods when the vessel is not undergoing tank cleaning.
2. Good quality inert gas reduces internal tank corrosion.
3. Higher discharge rates may be obtained by utilizing inert gas system pressure to aid the cargo pumps, thereby reducing tank vessel turn around time.

Background of Proposed Amendments

The President's March 17, 1977 message to Congress included direction that certain ship constructinn and equipment standards be reformed. Included in the direction was instructions to the Secretary of Transportation to develop new rules within 60 days for inert gas systems on all oil tankers of 20,000 dwt or more, U.S. and foreign, that call at American ports. The proposal in this document is in response to the President's instructions.

Subpart 32.53 currently applies to each tankship of 100,000 dwt or more (metric) and each combination carrier of 50,000 dwt or more (metric) that has a keel laying date after December 31, 1974. The following are excepted from the subpart:

1. Vessels that carry Grade E cargo at a temperature that is 5° C (9° F) or more below its flashpoint or that carry only liquefied gas cargo.
2. Foreign flag tankship of a nation signatory to the International Convention for the Safety of Life at Sea, 1960 that have on board a current valid Safety Equipment Certificate.

It is proposed to retain the substance of this applicability but withdraw the exception to foreign tank-

ships having on board a current valid Safety Equipment Certificate.

U.S.-flag vessels required to fit inert gas systems under 46 CFR Subpart 32.53, which was effective on February 26, 1976 (published in the January 26, 1976 FEDERAL REGISTER (41 FR 3838)) would not be allowed to extend the application of the subpart to the new effective date of this proposed amendment.

In addition, it is proposed to add to the applicability of the subpart tankships and combination carriers of 20,000 dwt or more. In order to allow orderly implementation by industry, it is proposed that those U.S. and foreign tankships or combination carriers that are constructed or converted under a contract awarded before [a date would be inserted that is 6 months after publication of the rule] would have to comply with the inert gas systems requirements within five years after the effective date of the amendment. U.S. tankships or combination carriers contracted for after [a date would be inserted that is 6 months after publication of the rule] would be required to fit an inert gas system on or after the effective date of the amendment. Foreign tankships or combination carriers contracted for after [a date would be inserted that is 6 months after publication of the rule] would have to comply with the inert gas system requirements within five years after the effective date of the amendment.

Since the proposal applies to foreign vessels, in addition to the U.S. vessels currently being regulated, the terms flammable or combustible cargo are used in Subpart 32.53 in lieu of grade classifications to aid comprehension by any reader not familiar with the United States classification of oil cargoes.

Proposed Exceptions. The President's message stated that all oil tankers would be required to be fitted with the provisions outlined in his message. In this proposal, the present exception to the requirement for fitting of an inert gas system on a tankship if it carries Grade E cargoes is continued since in context the President's direction was to extend applicability to smaller vessels rather than to bring low risks substances under regulations. Grade E cargo is by definition a high flashpoint cargo of relatively low risk. Both the international recommendation, IMCO Res. A.271 (VIII), and Coast Guard regulations in 46 CFR 32.53, recognize this and incorporate an exception for high flashpoint liquids.

This proposal has been reviewed for economic effects under Department of Transportation "Policies to Improve Analysis and Review of Regulations" (41 FR 16200).

The analysis shows that approximately 1,000 foreign flag and 250 U.S.-flag tank vessels would be affected by the requirement for the fitting of inert gas systems. The projected costs of the requirements to the U.S. consumer over a 9-year period is estimated at one billion seven hundred million dollars.

The expected benefit of the requirement is a reduction in the number of intank explosions. These explosions in the past have not only endangered the ship and its crew but port facilities and related waterways.

In accordance with the preceding, it is proposed to amend Subchapter D of Title 46, Code of Federal Regulations, as follows:

§ 30.01–5 [Amended]

1. By amending § 30.01–5(e)(1) of Subpart 30.01 by striking the words "and the safety and cargo handling requirements in Subparts 35.30 and 35.35 of this subchapter" and inserting "Subpart 32.53, Subpart 35.30, and Subpart 35.35 of this subchapter" in place thereof.

2. By revising § 32.53–1 of Subpart 32.53 to read as follows:

§ 32.53–1 Application—T/All.

(a) Except as provided in paragraph (b) of this section, this Subpart applies to tankships or combination carriers of 20,000 dwt tons or more as follows:

(1) Each U.S. Flag tankship that is certificated to carry Grades A, B, C, and D liquids.

(2) Each foreign flag tank vessel engaged in the trade of carrying flammable or combustible liquids to or from a U.S. port, or place, or any such vessel destined from one port or place in the United States to another port or place in the United States.

(b) This Subpart does not apply to vessels designed to carry only—

(1) Liquefied gas cargo; or

(2) Cargo that has a flashpoint of 65.5°C (150°F) or higher by an open cup test (Grade E).

NOTE.—(1) A U.S. tankship of 100,000 dwt tons or more or a U.S. combination carrier of 50,000 dwt tons or more, with a keel laying date on or after January 1, 1975, must comply with Subpart 32.53 after February 25, 1976.

(2) U.S. and foreign flag vessels under § 32.53–1, except those vessels described in note 1, that are constructed or converted under a contract awarded before the effective date of the rule must comply with Subpart 32.53 within 60 months after the effective date of the rule.

(3) A foreign flag vessel under § 32.53–1 that is constructed or converted under a contract awarded after the effective date of rule must comply with Subpart 32.53 within 60 months after the effective date of the rule.

(4) A U.S. vessel under § 32.53–1 that is constructed or converted under a contract awarded after the effective date of the rule must comply with Subpart 32.53 at time of building or conversion. (Sec. 201, 86 Stat. 427, as amended (46 U.S.C. 391a); 49 CFR 1.46(n)(4))

NOTE.—The Coast Guard has determined that this document contains a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended, and OMB Circular A–107 and certifies that an Economic Impact Statement has been prepared.

Dated: May 9, 1977.

O. W. SILER,
Admiral, U.S. Coast Guard,
Commandant.

COAST GUARD RULEMAKING

(Status as of 1 June 1977)

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
BOATING SAFETY							
Lifesaving devices on white water canoes & kayaks (CGD 74–159) comment period extended 6–12–75	2– 4–75		7–15–75	X			
Standards for flotation (CGD 75–168)	4–29–76		7–30–76			4–18–77	8– 1–77
Safe loading and flotation standards (CGD 75–176)	5– 6–76		6–21–76			1–13–77	7–22–77
Low- and non-powered boat capacity (CGD 74–268)	6–24–76		8–24–76	X			
Safety standards for boat gasoline fuel systems (CGD 74–209); Corrected 5–16–77	9–30–76		12– 1–76			1–31–77	8– 1–77
Visual distress signals on boats (CGD 76–183); Advance notice	9–27–76		2– 1–77	X			
Standards for electrical systems (CGD 73–217). Corrected 11–11–76 and 5–16–77	10– 4–76		12– 1–76			1–31–77	8– 1–77
Personal flotation devices, label rewording (CGD 75–008)	12–20–76		3– 3–77	X			
Personal flotation devices, information pamphlet (CGD 75–008a)	12–20–76		3– 3–77	X			
Power ventilation on boats (CGD 76–082); Advance notice	3–21–77		5– 5–77	X			
BRIDGE REGULATIONS							
Fox River, WI (CGD 75–035)	2– 6–75		3– 7–75	X			
Mystic River, MA (CGD 75–053)	3–27–75		4–29–75	X			
West Palm Beach Canal, FL (CGD 75–070)	3–27–75		4–29–75	X			
Norwalk River, CT (CGD 75–216)	11–21–75		12–31–75	X			
Lake Champlain, VT (CGD 75–222)	12– 8–75		1– 9–76	X			
Mitchell River, MA (CGD 76–014)	2–19–76		4– 5–76	X			
Menominee River, WI (CGD 76–069)	4–22–76		5–25–76	X			
Bayou Lafourche, LA (CGD 76–077)	6–14–76		7–20–76	X			
Sabine Lake, TX (CGD 76–112)	6–24–76		7–26–76	X			
Dodge Island, FL (CGD 76–139)	8– 2–76		9– 7–76	X			
Atchafalaya River, LA (CGD 76–168)	8–30–76		10– 1–76	X			
Weymouth Fore River, MA (CGD 76–175)	9–23–76		10–29–76	X			
Oakland Inner Harbor Tidal Canal, CA (CGD 76–119)	10–28–76		11–30–76	X			
Niantic River, CT (CGD 76–167)	11– 1–76		12– 3–76	X			
Niagara River, NY (CGD 76–210)	11–18–76		12–20–76	X			
St. Johns River, FL (CGD 76–178)	11–18–76		12–20–76	X			
Dutch Kills, NY (CGD 76–216)	11–29–76		12–31–76	X			
Lake Washington Ship Canal, WA (CGD 76–117)	11–29–76		12–28–76	X			
AIWW, North Palm Beach, FL (CGD 76–217)	12– 6–76		1– 4–77	X			
Pequonnock R., Yellow Mill Channel, and Johnson Ck., CN (CGD 76–219)	12– 6–76		1–11–77	X			
Harlem River, NY (CGD 76–221)	12– 9–76		1–11–77	X			
Sandusky Bay, OH (CGD 76–205)	12– 9–76		1–12–77	X			
AIWW, New Smyrna Beach, FL (CGD 76–228)	12–20–76		1–25–77	X			
Sarasota County, FL (CGD 76–230)	12–23–76		1–25–77	X			
Fox River, WI (CGD 75–035)	3–21–77		4–26–77	X			
Sarasota County, FL (CGD 76–230)	12–23–77		4–19–77	X			

Coast Guard Rulemaking—Continued

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
MARINE ENVIRONMENT AND SYSTEMS (GENERAL)							
Pipelines, lights to be displayed (CGD 73–216). Corrected 10–18–74	9–19–74	10–21–74	11– 4–74	X			
Visual identification of tank barges (CGD 75–093). Corrected 2–23–76	2– 5–76		3–16–76	X			
Anchorages, Boston Harbor, MA (CGD 76–40)	3–29–76		5–14–76		5–16–77		
Navigation safety regulations (CGD 74–77)	5– 6–76 Corrected 5–13–76	6–11–76 Wash. 6–17–76 San Fran.	8– 6–76			1–31–77	6– 1–77
Tug assistance (CGD 76–025); Advance notice. Corrected 5–13–76	5– 6–75		8– 6–76	X			
Minimum net bottom clearance (CGD 76–051); Advance notice. Corrected 5–13–76	5– 6–76		8– 6–76	X			
Regulated navigation areas, Apra Outer Harbor, Guam (CGD 74–281)	5–17–76		6–16–76	X			
New Orleans Vessel Traffic Service (CGD 75–112)	6–17–76		9– 3–76	X			
Disestablishment of special anchorage, San Diego Harbor, CA (CGD 76–185)	11–18–76		1– 3–77	X			
Special anchorage area, Camden Harbor, ME (CGD 76–43)	12–13–76		4– 1–77	X			
Special anchorage area, Put-In-Bay, OH (CGD 76–103)	12–13–76		1–13–77	X			
Special anchorage area, Monterey Harbor, CA (CGD 76–45)	12–20–76		3– 3–77	X			
Special anchorage areas, Trinidad Bay, CA (CGD 76–105)	12–23–76		3– 4–77	X			
Bridge permit actions (CGD 76–144)	1–17–77		3– 3–77	X			
Puget Sound VTS (CGD 75–173)	1–17–77		3– 3–77	X			
Special anchorage areas, Islands of Hawaii, Kauai, and Oahu, HI (CGD 76–186). Corrected 2–22–77	1–21–77		3– 7–77	X			
LORAN–C on vessels of 1600 gross tons or more (CGD 77–002). Corrected 2–17–77	1–31–77	3– 4–77 Wash. 3–16–77 San Fran.	4–20–77	X			
Prince William Sound VTS (CGD 76–032). Corrected 2–14–77	2– 7–77		4– 6–77	X			
Special anchorage area, Mackeral Cove, Bailey Island, ME (CGD 76–046)	3– 3–77		4–17–77	X			
Special anchorage area, St. Simons Island, GA (CGD 76–047)	3– 7–77		4–20–77	X			
Enlargement of special anchorage area, Beverly Harbor, Salem, MA (CGD 76–192)	3– 7–77		4–20–77	X			
Special anchorage area, Dana Point Harbor, CA (CGD 76–197)	9– 7–77		4–20–77	X			
Regulated navigation area, Kittery, ME (CGD 76–235)	3–14–77		4–28–77	X			
Authorization of safety zones	3–17–77		4–29–77	X			
Backup radar and collision avoidance equipment (CGD 77–016)	5–16–77	6–16–77 San Diego 6–21–77 Wash.	11–15–77				
MERCHANT MARINE SAFETY (GENERAL)							
Metal boring, shavings, turnings, and cuttings (CGD 75–133)	8– 1–75		9–15–75			5– 2–77	7–31–77
Marine occupational safety and health standards (CGD 75–101); Advance notice; comment deadline extended 12–11–75	8–11–75		1–15–76	X			

Coast Guard Rulemaking—Continued

	Notice of proposed rulemaking	Public hearing	Deadline for comments	Awaiting final action	Withdrawn	Published as rule	Effective date
Tank vessels; air compressors, cargo handling room bilges (CGD 75–017)	8–13–75	.....	9–29–75	....	.....	5–19–77	6–15–77
Vessel inspection regulations (CGD 75–074)	9–16–75	.....	10–31–75	....	.....	1–31–77	6– 1–77
Elevators and dumbwaiters, ANSI Code (CGD 75–001)	4– 5–76	.....	5–21–76	X	.....	.....	.....
Vapor recovery systems in cargo transfer operations (CGD 75–208); Advance notice	4– 5–76	.....	6–21–76	X	.....	.....	.....
Towing vessel stability (CGD 76–018); Advance notice	4–12–76	.....	7– 1–76	X	.....	.....	.....
Measurement of vessels (CGD 75–078)	4–22–76	.....	6– 7–76	X	.....	.....	.....
Segregated ballast, certain existing tank vessels (CGD 76–075)	5–13–76	.....	6–30–76	X	.....	.....	.....
Lifesaving equipment for Great Lakes vessels (CGD 76–033); Advance notice	6– 7–76	.....	9– 7–76	X	.....	.....	.....
Bulk dangerous or extremely flammable liquid cargoes (CGD 73–096)	6–24–76	8– 3–76	8–20–76	X	.....	.....	.....
Commercial diving occupational safety and health standards (CGD 76–009); Advance notice	7–15–76	.....	8–16–76	X	.....	.....	.....
Semi-portable CO_2 systems testing (CGD 75–225)	7–26–76	.....	9–10–76	X	.....	.....	.....
Integral diesel fuel tanks, small passenger vessels (CGD 75–184)	7–26–76	.....	10–26–76	X	.....	.....	.....
Damage stability standards for hopper dredges (CGD 76–080); Advance notice	8– 2–76	.....	9–16–76	X	.....	.....	.....
Small passenger vessels, first aid kit (CGD 75–042)	8–19–76	.....	10– 5–76	X	.....	.....	.....
Fees for duplicate documents or licenses (CGD 76–124)	9– 2–76	.....	10–18–76	....	.....	5– 9–77	6– 7–77
Foreign flag tank vessels, shipping papers (CGD 76–081)	9– 2–76	.....	10–18–76	X	.....	.....	.....
Self-propelled vessels carrying bulk liquefied gases (GCD 74–289)	10– 4–76	11–15–76	12–15–76	X	.....	.....	.....
Tank vessels; loading information (CGD 75–041)	10–12–76	.....	11–29–76	X	.....	.....	.....
Benzene carriage requirements (CGD 75–075); Advance notice	12–23–76	.....	3– 7–77	X	.....	.....	.....
Marine investigation regulations (CGD 76–149)	12–30–76	.....	3– 1–77	X	.....	.....	.....
Manning of vessels (CGD 75–178)	3–14–77	.....	4–20–77	X	.....	.....	.....
Filling and sounding pipes, gasoline and diesel fuel tanks (CGD 76–154)	3–17–77	.....	4–28–77	X	.....	.....	.....
Engine department ratings (CGD 74–045)	1– 6–77	.....	2–20–77	....	.....	5–16–77	6–15–77
Radar observer endorsement (CGD 76–193)	1–17–77	.....	3– 3–77	X	.....	.....	.....
Carriage of solid hazardous materials in bulk (CGD 76–198)	4– 4–77	.....	5–15–77	X	.....	.....	.....
Great Lakes pilotage rates (CGD 77–045); Corrected 4–28–77	4–18–77	.....	5–18–77	X	.....	.....	.....
Tankerman requirements (CGD 74–44); Corrected 5–5–77	4–25–77	6–21–77	7– 7–77	....	.....	.....	.....
Qualifications of person in charge of oil transfer operations (CGD 74–44a)	4–25–77	6–21–77	7– 7–77	....	.....	.....	.....
Mobile offshore drilling units (CGD 73–251)	5– 2–77	6– 1–77	6–29–77	....	.....	.....	.....
Manual of cargo transfer procedures (CGD 77–148)	5– 9–77	.....	6–20–77	....	.....	.....	.....
Application of chemical tanker standards to existing ships (CGD 73–096a)	5– 9–77	.....	6– 7–77	....	.....	.....	.....
Oil tanker segregated ballast and double bottoms (CGD 77–058)	5–16–77	6–16–77 San Diego, 6–21–77 Wash.	11–15–77	....	.....	.....	.....
Emergency steering standards for oil tankers (CGD 77–063)	5–16–77	...do.....	11–15–77	....	.....	.....	.....
Tank vessel inert gas systems (CGD 77–057)	5–16–77	...do.....	11–15–77	....	.....	.....	.....
Lights and retro-reflective material for life preservers (CGD 76–028)	5–23–77	.....	7– 4–77	....	.....	.....	.....

NOTE: This table which will be continued in future issues of the Proceedings is designed to provide the maritime public with better information on the status of changes to the Code of Federal Regulations made under authority granted the Coast Guard. Only those proposals which have appeared in the Federal Register as Notices of Proposed Rulemaking will be recorded. Proposed changes which have not been placed formally before the public will not be included:

MERCHANT MARINE SAFETY PUBLICATIONS

The following publications of marine safety rules and regulations may be obtained from the nearest marine inspection office of the U.S. Coast Guard.* Because changes to the rules and regulations are made from time to time, these publications, between revisions, must be kept current by the individual consulting the latest applicable Federal Register. (Official changes to all Federal rules and regulations are published in the Federal Register, printed daily except Saturday, Sunday, and holidays.) The date of each Coast Guard publication in the table below is indicated in parentheses following its title. The dates of the Federal Registers affecting each publication are noted after the date of each edition.

The Federal Register will be furnished by mail to subscribers, free of postage, for $5.00 per month or $50 per year, payable in advance. The charge for individual copies is 75 cents for each issue, or 75 cents for each group of pages as actually bound. Remit check or money order, made payable to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

CG No.	TITLE OF PUBLICATION
101–1	Specimen Examinations for Merchant Marine Deck Officers (2d and 3d Mate) (5–1–75).
101–2	Specimen Examinations for Merchant Marine Deck Officers (Chief Mate and Master) (4–1–76).
108	Rules and Regulations for Military Explosives and Hazardous Munitions (4–1–72). F.R. 7–21–72, 12–1–72, 6–18–75.
*115	Marine Engineering Regulations (6–1–73). F.R. 6–29–73, 3–8–74, 5–30–74, 6–25–74, 8–26–74, 11–14–74, 6–30–75, 9–13–76.
*123	Rules and Regulations for Tank Vessels (1–1–73). F.R. 8–24–73, 10–3–73, 10–24–73, 2–28–74, 3–18–74, 5–30–74, 6–25–74, 1–15–75, 2–10–75, 4–16–75, 4–22–75, 5–20–75, 6–11–75, 8–20–75, 9–2–75, 10–14–75, 12–17–75, 1–21–76, 1–26–76, 2–2–76, 4–29–76, 9–30–76, 1–31–77, 5–19–77.
169	Navigation Rules—International—Inland (5–1–77).
*172	Rules of the Road—Great Lakes (7–1–72). F.R. 10–6–72, 11–4–72, 1–16–73, 1–29–73, 5–8–73, 3–29–74, 6–3–74, 11–27–74, 4–16–75, 4–28–75, 10–22–75, 2–5–76, 1–13–77.
174	A Manual for the Safe Handling of Flammable and Combusible Liquids and Other Hazardous Products (9–1–76).
176	Load Line Regulations (2–1–71). F.R. 10–1–71, 5–10–73, 7–10–74, 10–14–75, 12–8–75, 1–8–76.
182–1	Specimen Examinations for Merchant Marine Engineer Licenses (2d and 3d Assistant) (4–1–75).
182–2	Specimen Examinations for Merchant Marine Engineer Licenses (First Assistant) (4–1–76).
182–3	Specimen Examinations for Merchant Marine Engineer Licenses (Chief Engineer) (4–1–76).
184	Rules of the Road—Western Rivers (6–1–72). F.R. 9–12–72, 12–28–72, 3–8–74, 3–29–74, 6–3–74, 11–27–74, 4–16–75, 4–28–75, 10–22–75, 2–5–76, 3–1–76, 6–10–76, 3–31–77, 4–7–77, 4–21–77.
*190	Equipment Lists (5–1–75). F.R. 5–7–75, 6–2–75, 6–25–75, 7–22–75, 7–24–75, 8–1–75, 8–20–75, 9–23–75, 10–8–75, 11–21–75, 12–11–75, 12–15–75, 2–5–76, 2–23–76, 3–18–76, 4–5–76, 5–6–76, 6–10–76, 6–21–76, 6–24–76, 9–2–76, 9–13–76, 9–16–76, 10–12–76, 11–1–76, 11–4–76, 11–11–76, 12–2–76, 12–23–76, 4–7–77, 4–11–77, 4–21–77, 5–19–77, 5–26–77.
*191	Rules and Regulations for Licensing and Certification of Merchant Marine Personnel (11–1–76), 3–3–77, 5–16–77, 5–26–77.
*200	Marine Investigation Regulations and Suspension and Revocation Proceedings (5–1–67). F.R. 3–30–68, 4–30–70, 10–20–70, 7–18–72, 4–24–73, 11–26–73, 12–17–73, 9–17–74, 3–27–75, 7–28–75, 8–20–75, 12–11–75, 5–6–76.
227	Laws Governing Marine Inspection (7–1–75).
239	Security of Vessels and Waterfront Facilities (5–1–74). F.R. 5–15–74, 5–24–74, 8–15–74, 9–5–74, 9–9–74, 12–3–74, 1–6–75, 1–29–75, 4–22–75, 7–2–75, 7–7–75, 7–24–75, 10–1–75, 10–8–75, 6–3–76, 9–27–76, 2–3–77, 3–31–77.
*257	Rules and Regulations for Cargo and Miscellaneous Vessels (4–1–73). F.R. 12–22–72, 6–28–73, 6–29–73, 8–1–73, 10–24–73, 12–5–73, 3–18–74, 5–30–74, 6–24–74, 1–15–75, 2–10–75, 8–20–75, 12–17–75, 4–29–76, 6–10–76, 8–5–76, 9–30–76, 1–31–77.
258	Rules and Regulations for Uninspected Vessels (4–1–77).
*259	Electrical Engineering Regulations (6–1–71). F.R. 3–8–72, 3–9–72, 8–16–72, 8–24–73, 11–29–73, 4–22–75, 6–24–76.
268	Rules and Regulations for Manning of Vessels (12–1–73).
293	Miscellaneous Electrical Equipment List (7–2–73).
*320	Rules and Regulations for Artificial Islands and Fixed Structures on the Outer Continental Shelf (7–1–72). F.R. 7–8–72.
*323	Rules and Regulations for Small Passenger Vessels (Under 100 Gross Tons) (9–1–73). F.R. 1–25–74, 3–18–74, 9–20–74, 2–10–75, 12–17–75, 9–30–76, 1–31–77.
329	Fire Fighting Manual for Tank Vessels (1–1–74).
439	Bridge-to-Bridge Radiotelephone Communications (12–1–72). F.R. 12–28–72, 3–8–74, 5–5–75.
467	Specimen Examinations for Uninspected Towing Vessel Operators (10–1–74).

CHANGES PUBLISHED DURING MAY 1977

CG–123, Federal Register of May 19.
CG–169, Federal Register of May 1.
CG–190, Federal Registers of May 19 & 26.
CG–191, Federal Registers of May 16 & 26.

*Due to budget constraints or major revision projects, publications marked with an asterisk are out of print. Most of these pamphlets reprint portions of Titles 33 and 46, Code of Federal Regulations, which are available from the Superintendent of Documents. Consult your local Marine Inspection Office for information on availability and prices.

U.S. GOVERNMENT PRINTING OFFICE: 1977

DEPARTMENT OF TRANSPORTATION
U. S. COAST GUARD
WASHINGTON, D. C. 20590

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
U. S. COAST GUARD
DOT-514