OIL SPILL OFF NANTUCKET, MASSACHUSETTS

HEARING

BEFORE THE

SUBCOMMITTEE ON ADMINISTRATIVE PRACTICE AND PROCEDURE

OF THE

COMMITTEE ON THE JUDICIARY

UNITED STATES SENATE

NINETY-FOURTH CONGRESS

SECOND SESSION

ON

DAMAGE CAUSED BY THE OIL SPILL OF THE SHIP THE "ARGO MERCHANT," DECEMBER 15, 1976

DECEMBER 22, 1976

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CONTENTS

WEDNESDAY, DECEMBER 22, 1976

STATEMENTS

TESTIMONY

PREPARED STATEMENTS

APPENDIX

ADDITIONAL STATEMENTS

NEWSPAPER ARTICLES

LETTERS

MISCELLANEOUS

OIL SPILL OFF NANTUCKET, MASSACHUSETTS

WEDNESDAY, DECEMBER 22, 1976

U.S. SENATE,
SUBCOMMITTEE ON ADMINISTRATIVE
PRACTICE AND PROCEDURE OF THE
COMMITTEE ON THE JUDICIARY,
Washington, D.C.

The subcommittee met at 6:30 p.m., in room A-2003, JFK building, Boston, Massachusetts, Honorable Edward M. Kennedy, chairman of the subcommittee, presiding.

Present: Senators Kennedy, Brooke and Pell; Senator-elect John H. Chafee; Representatives Studds and Heckler.

Also present: Thomas M. Susman, chief counsel; Mark Schneider, investigator; Mary Murtagh, staff assistant, and John Pressely, minority counsel.

OPENING STATEMENT OF SENATOR KENNEDY

Senator KENNEDY. The subcommittee will come to order. This is an emergency hearing of the Subcommittee on Administrative Practice and Procedure of the Senate Judiciary Committee. We are attempting to place on the record now all of the facts surrounding the grounding, the breaking apart and the massive spill from the oil tanker *Argo Merchant* off Nantucket Sound. We intend to understand, so far as humanly possible, why this tragedy occurred, a tragedy which is the Nation's most devastating marine environmental disaster. It threatens the future of Georges Bank fishing grounds, which yields a $142 million annual catch per year, providing jobs for some 32,000 fishermen, and food for consumers throughout the world.

We must determine what practices, procedures or laws might have prevented this event. Every day the equivalent of one *Argo Merchant* comes into Boston harbor.

We will attempt to provide the Congress and the people of this State and the Nation recommendations based on our hearings as to what measures must be taken to minimize the risk of this event occurring again.

Comprehensive Federal and State action is essential. The 7.6 million gallons of oil the *Argo Merchant* dumped into the waters of New England are only a fraction of the total oil which is carried by oil tankers in Boston harbor. Throughout the year, and particularly during these winter months, tankers carrying home heating oil and residual fuel oil come into port almost daily. Of the 6.3 million gallons

of residual fuel oil that Massachusetts uses every day, nearly 90 percent is imported from foreign shores. The vast percentage of that oil is used during the winter months.

We cannot afford this kind of Christmas nightmare ever again. We intend to be sure every precaution is taken which can reduce the chances of its reoccurrence.

The first step is to find out the immediate and underlying causes of this accident and whether anything more can be done to reduce the damage.

We are aware, from press reports, that the *Argo Merchant* was reported to be 10 to 15 miles off its course. We need to know why there is not some way—particularly now with our radar and satellite capacity—to know when ships which are 20 or even 100 miles offshore are running off course. We need to know whether safety and operating standards were adequate and whether they were enforced.

This appears of particular importance since the National Academy of Sciences last July issued a report on ship accidents. Human error was cited as "a contributing, if not fundamental factor" in a substantial number of shipping accidents. They cited Lloyds of London, the American Hull Insurance Syndicate, as well as U.S. Coast Guard figures, which seemed to show that in as many as 85 percent of the accidents, human error was involved. We want to know what can be done to improve both safety and operating standards and enforcement.

I also want to know what special precautions must be taken for repeat offenders, as this tanker apparently was, having run aground twice and spilled portions of its oil not once in the past, but 18 times in the past.

Are there special precautions taken in these cases and, if not, why not?

I think this is terribly important. We know, for example, that a decision has been made to review the entry of liquid natural gas ships into the Port of Boston and in other ports around this country. That decision has been made by the Coast Guard. We want to know if all the requirements that are placed on the airlines, for example, that they have to follow certain routes in order to come into an airport should be an example for tanker traffic. We hope to demonstrate during this hearing, that there is ample authority, power and responsibility within the Coast Guard generally to set up various procedures to require ships that are coming into Boston or any harbor of Massachusetts to follow specific sea lanes, not as an optional feature, but required. I think we will find out that the Coast Guard, as well, has power to require special navigational equipment to ensure that they will not see the deviations from course which we saw in this particular case. I think the Coast Guard has the authority and the power to ensure doublebottoming, and we cannot state as a fact to date that if there had been doublebottoming, this ship would not have broken up.

I think the Coast Guard also has the authority and responsibility to say whether certain ships are so basically weak in structure that they inherently pose a threat to our environment coming into any of the ports of Massachusetts and other ports of this country.

I think they have, as well, the authority to ensure that crew members on ships have adequate training in order to be permitted to come

into our ports. But all of this is not going to put the oil that is spilled off our shores back into the ship and rid us of this marine disaster.

We want to know how this happened, why it happened, whether it could have been avoided, and what can be done to mininize the damage.

A third issue to be developed during this hearing is the impact of this spill on our fishery resources on the area's economy, and on our tourist and environmental resources.

The sight of scallops covered with black scum at this early date is more than frightening when one recalls that we are talking about 7.6 million gallons of heavy industrial oil, most of which has been sighted spreading over an area estimated at some 65 miles.

At present, we are certain only of a vast potential damage, and we must determine not only whether anything can be done to minimize the immediate effect of this spill but also what can be done to determine as early as possible its ultimate consequences.

A final issue relates to providing compensation and restitution for all of the costs related to this disaster: from the costs of the U.S. Coast Guard's efforts—efforts which clearly took place in the face of enormously adverse weather conditions—to the future costs to our fishermen from damage to the Georges Bank fishing grounds.

We are interested in listening to our fishermen this evening, to learn of their experience with tankers moving back and forth across our waters. The fishermen have communicated with me and they have written to me about instance after instance in which they have seen these tankers moving across extremely shallow waters. This kind of a situation, this enormous tragedy we face tonight could have happened any time in the past and we may very well be in danger of it happening again. These are some of the questions that we hope to receive answers to this evening. This subcommittee will continue to examine these matters in the days and weeks ahead.

It is already evident that there will be enormous tragic consequences which fully justify the Governor's request for a declaration of a major disaster, and I am looking forward to his testimony here this evening. I have talked with Carla Hills to urge the immediate processing of this request. We want to work very closely with you, Governor, in ensuring that there will be early action on it. I am sure I speak for all of us in that effort.

The fishermen cannot await the outcome of lengthy legal suits. They have to feed their families this week and next week and the week after. I am hopeful that the representatives of the Economic Development Administration and the SBA will establish immediately a coordinated effort to provide relief to individuals and businesses who sustained damage from the effects of this spill.

Finally, let me emphasize that this disaster underscores the need to examine in detail the proposals relating to our energy needs. Only 2 days ago, the Secretary of Transportation approved plans for deepwater ports largely to be built by the major oil companies for supertankers more than ten times the size of the *Argo Merchant.*

The importance of ship construction standards, of ship operating, navigational and safety standards becomes even more obvious after a tragedy of this nature.

There are no special requirements for those larger ships. There are rather strict requirements for the deepwater ports themselves but not for those larger ships which have ten times the amount of oil of the *Argo Merchant*. This is something we must be aware of and act to correct.

Similarly, when the vulnerability of our fishing grounds and the actual consequences of the major oil spill are made clear, it will be evident that the proposed early summer leasing of offshore oil tracts in the Georges Bank area should be postponed—probably only a few months—until fully adequate safety and liability and environmental standards are enacted into law.

Those standards were included in the Outer Continental Shelf legislation which passed both the Senate and the House last session. That legislation included my amendments providing improved liability standards. This bill will again be considered early in the next session. A leasing delay, if necessary, would have virtually no impact on our energy needs, while it could provide major economic and environmental protections for our region.

After the headlines are gone, the people of this region—the fishermen, the residents, the local and state officials—will have to bear the final consequences of this spill. We will be living with those consequences today and tomorrow and far into the future. What we are seeking to do is to ensure that everything possible to minimize those consequences is being done and everything possible to prevent a reoccurrence will be set in motion.

Now, I have invited my colleague, Senator Brooke, to join us this evening, and I will ask him to make his comments. Of course, Gerry Studds, who represents the district, has been so active in this effort. Senator Claiborne Pell has followed all of these matters in the sea very closely and was really the author of the Seabed Treaty. Congresswoman Heckler, who is supporting all of our efforts is working close with us. We have Senator-elect Chafee to join us this evening, and we hope he will participate and ask whatever questions he would like as a full member of our panel this evening.

I will ask if Senator Brooke would care to make any comment and then follow with Gerry Studds.

OPENING STATEMENT OF SENATOR EDWARD W. BROOKE

Senator BROOKE. Thank you, Mr. Chairman.

First, I want to thank the Chairman for inviting my colleagues and me to attend this hearing of his subcommittee, and I want to acknowledge the presence here of His Excellency, the Governor of the Commonwealth of Massachusetts, the Honorable Michael Dukakis, who is seated in the front of the room and from whom you will hear later.

Naturally, we are all concerned with this disaster. I came up on the plane today with Russell Train, the Administrator of the Environmental Protection Agency, with the Assistant Secretary of Commerce, John Eden, who is the head of the Economic Development Administration, and also with Bob White of NOAA. They came up at the request of the President and Secretary of Commerce Elliott

Richardson. They are all here to testify before this subcommittee and to let it be known that the Federal Government stands ready to do everything that it possibly can to bring reparations, if necessary, to those who have been adversely affected by this disaster.

The President himself is very much concerned, and he has told us that his departments and agencies that have jurisdiction are ready, willing and able to do everything that they possibly can. Of course, we are concerned about the causes, but we are mostly concerned about what we can do at the present time to see that no one is too adversely affected by this disaster.

In addition to those agencies that I have mentioned, the regional director of SBA is here, and regional directors of other agencies. So the Federal Government is prepared.

I personally want to commend the Coast Guard, Rear Admiral Stewart and Captain Hein who, in my opinion, have done a magnificent job under the most difficult circumstances surrounding this disaster. They have worked tirelessly, and they are continuing to do everything they possibly can. No one knows yet the extent of this disaster. So this hearing, if it is able to make a real contribution—and I am sure that it will—will be to bring forth what the Federal Government and the State Government can do in order to help, first, the beleaguered fishermen, because they are the ones who immediately are hurt by this disaster and, secondly, tourists industries and those who live on the shorelines of Massachusetts and elsewhere who may be hurt by this disaster.

We do not know whether that oil is going to stay at the bottom of the ocean, and if so how adverse the impact on marine life will be, or if it will rise and come to shore in oil balls. We just do not know. So until we know, at least we can be prepared to help those who need helping, and we can, through this hearing, hopefully come up with legislation that can be passed.

I am not sure that the Coast Guard can do all of the things that Senator Kennedy thinks they can do. Maybe the Senator is right. Maybe the Coast Guard does have the power to prescribe regulations and rules without further support from Congress or the administration.

But I am sure that the Senator would be the first, among all of our colleagues to agree, that the Congress should pass legislation immediately to provide for tanker responsibility and safety so that these tankers that do travel through our waters are safe and that we do not have a recurrence of this disaster.

These are the things that will come out of this hearing. There are many witnesses to be heard, and I will not take any longer, just to say that we all stand ready to do everything possible to work to see, one, that such a disaster never occurs again and, two, to bring about reparations for those who have been injured.

Mr. STUDDS. May I just say very briefly I think, as the two Senators indicated, all of us in this room are aware of the difference literally and figuratively between the warmth part of this room and the Nantucket Shoals and the eventual disposition and fate of the oil that is just below the surface of the water and that which is on the bottom will be utterly unaffected by what transpires here this evening.

I think our purpose is to demonstrate to a very concerned people what responsibilities of which Federal agencies come into play at this point, what can and will be done, and to indicate to them the kinds of questions that the Congress will be asking, not so much this evening, but in the future when we have a chance to do some serious legislating.

It seems to me that there is irony piled upon irony in the situation that we now face off Nantucket. The "ifs," the "might have beens," the "if only we hads" are almost endless in this situation. The comprehensive oil spill liability legislation which we fought out of Committee in the House in the last Congress, had it been law now, we would have a dramatically different situation than the one which our fishermen confront and which is confronted by anyone else who may be confronted by these spills.

It is not the inadequacy of the existing liability legislation. It is the total absence of it. Spills occurring on the high seas are not reached by our existing laws and foreign-flag vessels sailing beyond 12 miles sail with impugnity and they spill oil with impugnity. That situation can and will be rectified, I think we can safely say, in the next Congress.

It is one of the tragedies, I guess, of human nature that it takes a situation of this magnitude to make us focus. Everybody paid a lot of attention last year to the 200-mile fishing limit because it had some drama, and very few people paid attention. But it is as of at least importance. It is no good to us to examine our fisheries jurisdiction and, the next month, wake up and find we have lost our fisheries resources. This is of substantial importance, of equal importance.

I think the other kinds of questions that are going to be raised are the implications for offshore drilling activities. If oil is brought ashore in buried pipelines from offshore pipelines, we reduce the risk that we have run with tankers in as we have just seen.

If, on the other hand, we allow that oil to be tankered ashore from offshore platforms, we compound the risk that we have just learned a very dangerous lesson about. We have learned a terribly ironic lesson about what the oil industry has told us about the state of cleanup technology.

Many people in this room have been to Louisiana and Texas and have seen the magnificent presentation by the industry about the state of the art of oil spill cleanups. Well, it simply is not there, and the warnings that the Northwest Atlantic is not the Gulf of Mexico have been very cruelly and ironically and tragically brought out in the last week. We do have to review, as the Senator suggested, the tanker safety regulations of the Coast Guard. We have to ask questions, particularly those things like the planning of consequences and most particularly those with the dismal safety record, and whether we should permit vessels with such records to enter our ports at all. We need to ask why it is 8 or 9 days after this incident that we are still unable to determine who owns that vessel.

WE WILL FIND OUT TRUE OWNERSHIP OF "ARGO MERCHANT"

The dummy corporation in Liberia under whose name she is registered may be dummy before dummy before dummy before dummy corporation. We are going to find out, no matter how long it takes us

who the real owners of this vessel are. If the Congress does its work, it seems to me within the next year they will know that the kind of apparent navigational stupidity and incompetence which seems to have led to this disaster will cost those owners and will cost them dearly. The liability which shall be theirs will legally be theirs if we do our work in the next Congress.

Finally, if I may echo Senator Brooke's words, there have been some piercing and searching and some harsh questions raised by understandably upset people about the performance of the Coast Guard. It seems to me that it is premature for us to start judging the performance of the Coast Guard. Obviously, in a situation of this magnitude, both Houses of Congress would take the most careful look at the situation in the coming months. At this point, however, there are men of the Coast Guard at sea under circumstances somewhat more adverse than those on the 20th floor of this building, and I think it behooves all of us to withhold our judgment.

Thank you, Senator.

Senator KENNEDY. Senator Pell.

Senator PELL. Thank you, Senator Kennedy.

Let me express my gratitude to you for holding this hearing, and thank you for letting a colleague from a neighboring state, with a common coastline, too, and his strong interest in the problem, participate in this hearing.

Speaking of the Coast Guard, I think that they have done their very best. I know. I am a captain in the Coast Guard reserve and have never been prouder to have been a captain in it. I do believe they have not had the equipment or the force perhaps to do the superhuman job that is necessary. If there is any fault anywhere, they said it was not enough of a sense of urgency in the upper reaches of our Government, and we all share that. We are all part of the Government. That has already occurred.

THREE ACTIONS MUST BE TAKEN: MINIMIZE THE DAMAGE, DECLARE THE AREA A DISASTER, AND PROCEED WITH INTERNATIONAL CONTROLS ON OCEAN SPACE

Now, we have to focus on the problem. As Senator Kennedy said, there are three related points. First, we have to minimize the damage, and in this regard I will continue to press, will press to the witnesses why my idea of sending torpedoes in or exploding the few could not be worked out, or some other chemical way found of destroying this oil. I think in a way of assistance, the second point, I would hope that the President would today, tomorrow, within a very few hours, declare this a disaster area so then the various trigger mechanisms could take effect, and we could start to be of assistance to the fishermen and determine what the harm is. Third and finally, it really underlines the necessity of moving ahead with the Law of the Sea, with some kind of international regime of law to control ocean space which is now in a state of complete anarchy. And for 10 years I have been preaching this, written a book on it, introduced treaties to this effect, and we have moved very slowly and specificially we should have passed by long since a liability convention and the fund convention which would have at least provided some economic recommendations,

and also the effect of those treaties being in service would then mean that the ships would be more careful.

I cannot believe that those conventions were in being, that a situation would have arisen where a shipper was being quite as careless and not using his mechanical aids to navigational devices and depending, as I understand it, entirely on terrestrial sights when you are within 10 miles or 20 miles from the shoreline.

Thank you.

Mrs. HECKLER. Thank you, Mr. Chairman.

I would just like to say that I, too, congratulate you for creating a focus. Hopefully for the forum which will bring forth possibly—and inevitably—a better presentation of the facts and perhaps clarification of the legislative course which we can follow and can be the groundwork for the beginning of a legislative coalition on your side of the aisle and your body with our body in the House, which cannot only talk about legislation but pass it in the Congress.

I am struck by the irony tonight which reminds me of the sense of duty of the sea which we all enjoyed just a few months ago when we saw the tall ships sail through Newport Harbor and into Boston Harbor, and now we are struck with the sense of horror of the sea as we see the same sea lanes filled and blackened with spilled oil.

I think that the issue has been described and discussed. I feel that we in Congress should question our own role. Certainly the Coast Guard has played a very important part in the situation and handling the emergency. One can ask questions, and we will at this hearing. But I think we have to ask questions of ourselves.

Have we given the right support to the Coast Guard?

Have we funded their operations sufficiently?

Have we given them the right and the power to grant or deny entry to foreign vessels which have been cited for violations of our laws?

So that I think it is a time for a search for the facts on behalf of our fishermen, our fishing interests, our coastline and our citizens and our economy, but it is also a time to search for our own role and to determine whether we have done enough and to rectify the weaknesses in the past with the kinds of legislation that Gerry has mentioned, that was handled in the Congress without passage.

Senator-elect CHAFEE. Thank you very much, Senator Kennedy, for permitting me to join you. I just hope that the first priority tonight would be how to minimize the damage. What can be done now? I think assessing blame for proposing preventative measures can follow at a prior time, but if there is anything that we or any of us can do now would be extremely of interest to me.

Senator KENNEDY. We will have as our first witness Governor Dukakis.

We look forward to hearing his testimony. We understand, Governor, you filed the application for the disaster relief.

I have in the last hour talked with President Ford and urged upon him, as well as Carla Hills, expeditious action on this request, which can make such a difference to the people that are affected.

The President indicated to me that I could communicate to all of you his very deep concern about this tragedy. He is familiar with the situation; he has indicated to me that as we will hear directly

from the spokesmen for the administration, he wants to ensure that all of the various Federal agencies give us every possible degree of support during this time. He will follow this request very closely himself. And he has indicated that he would issue a statement or press release within the next 12 to 18 hours on the degree of support we can expect.

This kind of concern is a source of satisfaction, I would hope, to all of us here in this state.

You may proceed.

STATEMENT OF HON. MICHAEL DUKAKIS, GOVERNOR, COMMONWEALTH OF MASSACHUSETTS

Governor DUKAKIS. Thank you, Senator Kennedy, Senator Brooke, Congressman Studds, Senator Pell, Congressman Heckler and Senator Chafee.

Before I get into my testimony this evening, I want to echo what has already been said by many of you tonight. I think it is important that we take time this evening to praise the truly heroic efforts of the men of the Coast Guard strike force who have been risking their lives off our coast to control the uncontrollable. They are volunteers fighting against insurmountable odds, and their work has been inspiring. I am not sure that they have really received the recognition that they deserve in the course of the last few days, and I just want it to be known at the outset that if there is going to be a congressional inquiry into this entire situation. I hope that it will be conducted at the policy level and not into the way that these tough and dedicated people have handled an almost impossible mission.

The tragedy which brings us here tonight raises literally hundreds of questions, some of which all of you have raised already. It has taken months, even years, to produce all of the answers, but already two issues stand out above all others, and I would like this evening to focus my remarks on those two concerns.

The first is how we can help the countless individuals and families whose lives will be directly affected by those millions of gallons of oil on our coast. The second is how we can prevent something like this from ever happening again.

Our independent fishermen who depend on fish for their families tables are going to be the first ones affected by the calamity, just at the time when the combined efforts of all of us, you and we here at the state level, as the result of the passage of the 200-mile limit, have just begun to turn around what we all know has been a chronically depressed fishing industry. The first signs of real hope for the future of the fishing industry in this region have, I think, begun to be seen and experienced.

They are operating, as I think all of you know, on a very fine line. If they lose their income, if they can't make payments on their boats—some of them incidently, have executed contracts for new boats, largely on the strength of the 200-mile limit, and our efforts to encourage them, and assist them—many of them will lose their boats and livelihood. And these people are going to need help very, very quickly.

APPLICATION FOR FEDERAL EMERGENCY ASSISTANCE FILED

I signed this afternoon the formal letter of application for a Federal declaration of emergency and for emergency assistance from the Small Business Administration. Those two documents are on their way to Washington, and I am very pleased, Senator, that you have had that conversation with the President, and I gather he is prepared to respond immediately.

If that declaration is made, loans will become available very quickly to ensure that the people do not lose the only means of making a living. If their equipment is damaged by oil, we must be ready to do everything that we can to see that they are able to repair or replace it.

Unemployment insurance and welfare assistance are hardly an inspiring response to this problem but, quite obviously, they, too, have to be made available if, in fact, they are needed.

The state working in partnership with municipal agencies, the coastal communities, the Federal Government, will set up one step disaster assistance offices to channel all relief. These offices will be in New Bedford, Gloucester and Chatham, and others will be established as the need arises.

Evelyn Murphy, our Secretary of Environmental Affairs, met this afternoon with representatives of the fishing industry, and we expect to have the people who are the most affected by this tragedy involved in all the planning and all the decisions that we at the state level will have to make on how assistance will have to be handled.

There are about 30,000 people involved directly or indirectly in the Massachusetts fishing industry: catching, processing, marketing and selling. This emergency assistance must be made available to any of the people affected by the spill. If the situation deteriorates and the oil does come ashore, then I think quite obviously we will have to ask for Federal assistance to help others who will be affected.

I think you all know that our tourist industry is almost a $1 billion business on the Massachusetts coast. Our coastline and beaches are among our most priceless assets. You can be sure that we will take every conceivable step to ensure that the integrity of that coastline is maintained, and the people whose jobs are dependent upon that integrity are protected.

Now, the second problem is how we can make this the last such disaster.

To begin with, it seems to me we need some very tough new legislation. I am not even sure that the fact that we can control exit and entry from port is satisfactory. We did mandate a 200-mile fishing limit. I do not quite see why we might not extend that concept to jurisdiction generally. I understand the international problems involved even as they are involved with the 200-mile fishing limit. There is not much point in having a 200-mile fishing limit if you cannot control the conditions of entry and material that can poison the fish. Only when we can increase our jurisdictional limits, exercise real control over the movements of the ships along our coast, and not just in our port and immediate port areas, can we really prevent these tankers from trying to take shortcuts in dangerous shoal areas and otherwise engage in the kind of conduct that was apparently engaged in here.

As Senator Kennedy has already mentioned, we obviously need regulations to keep aging and rusting obsolete ships out of our waters. Enforcement of construction and maintenance standards on Liberian and Panamanian and other convenience-flag ships is virtually nonexistent.

CONGRESS SHOULD CREATE TOUGHER STANDARDS FOR SHIP CONSTRUCTION AND MAINTENANCE

Congress should open hearings immediately to require tougher standards to be phased in. The most immediate requirement, it seems clear, is for up-to-date navigational equipment on every ship, and for properly maintained watches.

Once we have got that, we can start talking about double hull and twin propeller requirements.

I for one find it inconceivable that one thickness of steel separates the ocean from the cargo of most of our oil tankers. I also find it incredible that if the only engine on the tanker fails in a northeaster of Salem Harbor, there is nothing but an anchor to keep such a ship off the rocks. I feel very strongly that we have to tighten all controls on what kinds of ships we are going to allow to enter our ports and to ply along our coastline.

Finally, with an increase in our jurisdiction, we must also increase liability on the part of shipowners and operators who now threaten our shore virtually with impunity.

If the shipping company or an oil company goes bankrupt, paying off oil spill claims, it is a heck of a lot more fairer than getting off scot free because of some loophole in ancient and outdated admiralty laws.

Finally, let me say a word about offshore development. The tie-in with that it seems to me is obvious. In dealing with oil spills, as Congressman Studds has said many times and said again this evening, we cannot use Gulf of Mexico methods in the North Atlantic. I think we have seen that now, much to our great pain and the tragedy of it all.

There is going to have to be very necessary investment to develop the kind of technology to cope with the spills off our coast. I think it is clear again, as Congressman Studds has indicated, that we had better review pretty carefully the whole idea of carrying offshore crude oil to our refineries from rigs.

If offshore wells come in, there is a chance that they will be pumping oil every day equal to the cargo of the *Argo Merchant*. That oil will be loaded on to small coastal tankers which have the worst chronic spillage record of all oil carriers. Not only should pipelines be used if, in fact, we can develop those offshore resources, but I want to emphasize again, as so many of you have, the importance of congressional legislation with which all deference to the Federal presence will give the States and State Governments a real role in the offshore development process.

That legislation, as you know, did not go through. We are not asking for a veto power. We are asking for meaningful participation and full information.

I talked yesterday with Governor Andrus, soon to be the new Secretary of the Interior, and he has indicated to me that he hopes to be

available for a meeting the first week in January if all goes well and he can put his gubernatorial affairs in order. I have indicated to him, as I have previous to his appointment, to the Carter transition staff, that I want to sit down with him and with other people in the transition to discuss the issue which was embodied in that legislation, which failed in passage about state participation.

It looks to us as if by executive action and by Interior Department action, many of the things in that legislation could be accomplished simply by executive and secretary order.

AN EXECUTIVE ORDER WOULD BE BEST TO BEGIN PROCESS OF CHANGE

I do not want to be partisan but I do think we have an administration coming into office that is more sensitive to these problems than the previous administration, so I expect that I will be asking you and your staffs to work with me and the other coastal Governors, working with the new Secretary of Interior to see if we cannot immediately, without waiting for legislation, begin by executive order to get some of the process activated that was involved in that legislation.

But I can honestly say to you this evening that, after months and months of trying on our part, and after months and months of trying on your part, as this region's congressional delegation, it seems to me what has happened simply emphasizes and creates an even greater sense of urgency about the necessary involvement of the states, the limited state of the art, the fact that nobody really knows how to control this thing and how important it is that all of us at the State and Federal level be working together in tandem as we proceed, if we are, for the development of those offshore resources.

Finally, we are going to need legislation to recognize that oil spills are as much as a national disaster as hurricanes, tornadoes and broken dams. We really should not have to thread that legal line in this case, given what has happened.

Even though the effect of the spill is less visible than land-based disasters, we all know that it may well be even longer lasting and more pervasive than the kinds of things that we have traditionally dealt with under Federal emergency disaster legislation.

So if we are going to learn anything from this disaster, Mr. Chairman, and ladies and gentlemen, it must be that we cannot underestimate the power of the sea. We have to design systems that deal with oil delivery that can be as close to perfect as we can possibly make them. We are not even near that now. I think that is very clear. We are tolerating intolerable defects. We do not have the ability to correct our mistakes and, until we have that ability, we had better slow down and make doubly sure that we are doing things right before committing another irreversible wrong.

Senator KENNEDY. Thank you very much, Governor, for an excellent statement. As you are aware in the OCS legislation, additional authority would be granted to the states which would have given both you and the other Governors of the coastal states some of the kind of authority and power which you have indicated is so essential to protect our interests here in Massachusetts.

As you are aware, even that ran into a filibuster in the final hours of the Congress, and a filibuster principally conducted by oil produc-

ing States. All of us in the delegation were in strong support of this. I am hopeful that there will be early action on the OCS, and we will work closely together to ensure that the authority you need is granted.

I am under the impression that the kind of authority which you describe here from your conversation with Governor Andrus is the proper legislative approach. I would hope that it would be successful, and I am sure we will work very closely with you.

Governor DUKAKIS. Thank you, Senator.

Senator BROOKE. Governor, I talked with the SBA this evening. They said they received the applications but that the applications do not give specific detail, and they have this problem of only being able to act on tangibles rather than intangibles. I presume that message has gotten back to you.

Governor DUKAKIS. We will follow up as rapidly as we can with quantifiable information in that kind of thing, Senator.

NO ONE KNOWS AT THIS TIME TOTAL EXTENT OF DAMAGE

As you know, at this point, nobody is entirely sure as to precisely what we are talking about in terms of damage.

Senator BROOKE. I wondered myself how many specifics you actually could give them because you do not have the tangibles yourself.

Governor DUKAKIS. We will be following up the formal applications and letters with supplementary information. And in that respect I am sure we will be working with you to make sure that we have all the necessary documentation.

Senator BROOKE. I presume the question of the legal definition of a natural disaster, and I understand that they will not raise this question, will not have to be dealt with. That is a ridiculous issue in any case.

The law covers "other catastrophes"—certainly this qualifies as another catastrophe, so you should not have any problem if we need to use those powers.

Governor DUKAKIS. I am delighted to hear it.

Senator BROOKE. One further question, if I may, Governor. Has the State passed any new regulations, or do you propose any new regulations for the State that will protect us regarding tankers entering into Massachusetts Harbor?

Governor DUKAKIS. We have not. While I am not sure that anybody can rule it out definitively, Senator, as you know, given traditional Federal responsibility for navigation, interstate, international commerce and the rest of it, as a legal matter the State jurisdiction in these cases is very, very limited if nonexistent.

We really have little more authority than to go out there and clean up the mess and try as best we can to cope with the damage that it caused to our actual territory. But there is very little room here for State action so far as we can determine. Frankly, I think without shifting the responsibility back, because I think we are partners in this every step of the way, as we have with all of you, in the case of offshore development, it is a problem which needs broad comprehensive national legislation which can deal with some very difficult international problems. We want to cooperate and be a part of that

obviously and provide you with all of the input and information that we can.

But it seems to me very unwise to move on a kind of State by State basis.

Senator BROOKE. Well, I agree with you that we need comprehensive legislation. As Senator Kennedy said, we all support it.

But I wish you would pursue the possibilities of what the State itself can do in addition to what Federal legislation might be proposed.

Governor DUKAKIS. We will look into that.

Senator BROOKE. I think Gerry is absolutely right. It seems that we have to wait for some disaster, such as this, to get the Congress to move. But I would hope the State legislature would review its options.

Governor DUKAKIS. Not only that, but I want to repeat that in discussing the idea of possibe executive action immediately with Governor Andrus, I did not want to rule out what is a lot broader knowledge represented by Senator Pell.

You and your staffs may be aware of other agencies of the Federal executive branch which might have reserve authority if they appear to exercise it. It seems to me we ought to exhaustively look at that at the Federal level as well.

Senator BROOKE. One note of encouragement, and I will end my questioning.

One note of encouragement that I received from Carla Hills and Mr. Dunn tonight in my conversation was that money was not the problem. I think they have over $100 million left in the FDA fund now, and it has never been a problem with Congress to get funding. So we are not worrying about money.

I think what we are really talking about is where can we spend the money and how can we spend it wisely, and obviously, how can we spend it legally. But we are not talking about level of funds for a change.

Senator KENNEDY. Governor, if my colleague would yield.

The State of Alaska has enacted legislation to try and provide protection against some of the very serious kinds of disasters. That legislation is being challenged for a number of reasons which you mentioned, Governor.

So there has been some initiative. I want to support my colleague's request, but I would also mention that in the areas where States have undertaken some important responsibilities in this, they have been challenged, and some of them have been struck down. It is, nonetheless, an area which ought to be pursued.

Governor DUKAKIS. Not only that, but maybe we ought to force it a little bit. Conceivably, that would help provide some momentum.

LEASING RECOMMENDATIONS TO PROTECT FISHING AREAS OF COAST

Mr. STUDDS. May I just very, very briefly say amen to the entirety of your statement, Governor, and for the record to highlight one thing. One of the ironies that I had in mind when I spoke earlier.

You are personifying the "irate" Governor of the frontier State that so many of us have been speaking about in Washington. I want this record to reflect, particularly given the tragic circumstances under which we are now meeting, that your recommendations as the

Governor of our frontier State, mainly in the initial lease sale on Georges Bank, that no tract be leased within 50 miles of land, that no tract be leased within the richest fishing areas, and no tract be leased in the lobster areas, and that pipelines, buried pipelines be mandated by regulations, all four of those recommendations that you made as Governor and which we supported as the State's delegation, were utterly ignored and overruled by the Secretary of the Interior. That is the critical importance to the legislation you referred to, for example.

Thank you.

Senator KENNEDY. Senator Pell.

Senator PELL. No questions.

Mrs. HECKLER. I just want to say that I do support your statement, and I have also—I think all of us have been in constant contact with the White House and various sources.

I did speak today with the Interior Secretary, Ronald Coleman. You might be interested to know that they have authorized two additional monitoring vessels with attendant scientific personnel to establish baseline data on the ocean floor so that we can then forecast the damage based on the geological surveys, input, and the direction of the oil spills.

So that, at this point, and very late, we are starting to get the baseline information that we need, and the photographic equipment necessary has been assigned.

Again I want to reiterate what Senator Brooke has said, that in the Department of the Interior, they assured me there was no question of lack of finance.

The funding is there, and they will commit all of their resources to the present situation and to the tragedy and to the scientific study that must be conducted to lay the groundwork in the future. So this has been done, at least to this point.

Senator KENNEDY. Senator Chafee.

Senator-elect CHAFEE. No questions.

Senator KENNEDY. Fine.

Thank you very much, Governor.

Governor DUKAKIS. We will try to keep all of your offices and your staffs and yourselves posted.

Senator KENNEDY. Well, if you would like to join us, you are welcome to, but we know you have other responsibilities.

Governor DUKAKIS. We will try to keep you posted on exactly how we move and provide you with copies of all of the material that we are sending down so that we can work together. Thank you very much for having this hearing. I think it is important that it be held, and I appreciate very much your asking for my statement.

Senator KENNEDY. I see the Lieutenant Governor here. Is there anything you would like to add, Lieutenant Governor O'Neill?

STATEMENT OF HON. THOMAS P. O'NEILL III, LIEUTENANT GOVERNOR, COMMONWEALTH OF MASSACHUSETTS

Mr. O'NEILL. Senator, I, too, want to add to what the Governor said and Congressman Studds for highlighting the situation 20 miles off the coast of Nantucket.

I had an opportunity to take a plane out to the area where the *Argo Merchant* is and look at some of the——

Senator KENNEDY. Please speak up.

Mr. O'NEILL [continuing]. And look at some of the tragic things that are taking place out there and, too, I would like to add to what the Governor said: I have had an opportunity to talk to the strike force, the strike team that is currently working on behalf of the U.S. Coast Guard. I think that they are frustrated as each and every one of us are at this point.

I would, however, like to add to the formal record, a statement that I think is important. I want to point out at this point, too, that I would like to congratulate Congressman Studds for his very timely observation, given this untimely tragedy that has taken place and for his and your work that you have been developing over the last couple of years trying to develop with, first, the exploration phases and, finally, the developmental phases of the Outer Continental Shelf, given the oil industry and what we are trying to achieve here in the Commonwealth of Massachusetts.

I think that is tremendously important. But I want to add to what the Governor had to say in expressing as strongly as I possibly can the need for a very firm commitment on the part of the Federal Government to develop the technology necessary to prevent and cleanup oil spills.

The tanker *Argo Merchant* had split in two and spilled more than 5.6 million gallons of oil into the ocean. The spill threatens the livelihood of some 30,000 Massachusetts fishermen. It threatens the natural beauty, obviously, and the tourist trade of Cape Cod and Martha's Vineyard, as the Governor pointed out. But, most of all, it threatens the marine life on Georges Bank, the richest fishing area in all the world.

THIS OIL SPILL COULD HAVE BEEN PREVENTED

A sad story concerning the oil spill is that it did not have to happen. The first 72 hours after the ship ran aground were crucial, I think. Had we had the established guidelines, the standardized procedures to control or prevent open sea spills, the tremendous ecological threats we now face, we think, could have been greatly reduced.

In the first 11 months of the year, 531 oil tankers put in at Massachusetts ports. Eighty percent of those tankers came into the port of Boston. By December 31, nearly 600 tankers will have visited our ports, too.

With this volume of tanker traffic and the clear statistical probability of a spill it represents, it is almost incredulous that no procedure and statistics encountered any spill, no personnel from this area were trained in oil tanker salvaging, and no equipment was readily available to cleanup the spill in the first place.

Public Law 92–340 said that by January 1, 1976, the Coast Guard was to have promulgated rules and regulations concerning the maintenance and safety of oil tankers entering our waters. The only regulation that the Coast Guard has promulgated so far is segregated ballast for the separation of varying cargoes.

I for one am not prepared to cast my fate nor that of the State nor the people of the State to the winds. Those same winds that are now

depositing millions of gallons of oil on our seas. I think we must act as we did in the creation of the 200-mile fishing limitation with our State's delegation.

There we realized that the international community was not going to respect nor assist in the conservation of a valuable food resource. Now, it is painfully clear. The international community will not assist us in enforcing the safety standards on oil tankers nor assume liability for the damages caused by oil spills. I am therefore proposing legislation for an oil spill liability of up to 200 miles.

On November 11, 1975, I gave testimony before the Studds committee on the Oil Spill Liability Act itself. At that same time, I called for third party liability.

The legislation I am now proposing, we think, would go even further. In addition to 200 miles and third party liability, I propose (a) the giving of Coast Guard authority to mandate the use of specific travel lanes, to enforce the procedures, and confiscate foreign vessels, if necessary.

Secondly, having all vessels, both foreign and domestic, show true ownership or financial responsibility to satisfy liability claims.

Thirdly, to establish a $200 million liability fund through a tax imposed on the amount of oil or hazardous materials being transported.

UNLIMITED CLEANUP LIABILITY SHOULD BE EXTENDED TO VESSELS

Additionally, unlimited cleanup liability now in effect for offshore oil rigs and platforms should be applicable to vessels.

Third, the mechanism for quick settlement of oil spill damage claims, and clearly inspections of all tankers passing through American waters through the Bureau of Shipping.

Lastly, increasing individual liability to $150 per ton up to a maximum $35 million, increasing the ceiling from $14 million to $35 million.

The problem of oil tanker safety has not been addressed, we think, by the Federal Government. Fishermen tell me tankers have been using the area around Nantucket Shoals for a very long period of time. Nothing has been done and obviously nothing will be done until we have a strong concerted policy on the Federal level.

So that I think as to what the Governor had to say, and again I want to thank you, Senator Kennedy and your entire panel, for coming forth and providing a forum for the people of Massachusetts and the entire New England area.

Senator KENNEDY. Thank you very much, Lieutenant Governor O'Neill.

We are going to question the Coast Guard about the extent of existing authority for some of the things that you have mentioned.

What was your reading of the Ports and Water Safety Act of 1972? Do you not think that gives us the necessary authority?

Mr. O'NEILL. I think it does. I do not think, however, that the rules and regulations have been promulgated.

Senator KENNEDY. Have you reviewed those provisions for the authority which you have mentioned here?

Mr. O'NEILL. Do I what, Senator?

Senator KENNEDY. Have you reviewed the legislation and are you satisfied it does do that?

Mr. O'NEILL. I think we all, all the people, all the members of the State administration has had an opportunity to participate in this endeavor, to look at the——

Senator KENNEDY. Is that the principal authority that you cite, the Ports and Water Safety Act?

Mr. O'NEILL. Yes, Senator.

Senator KENNEDY. Is there any other Federal legislation in this area which would be helpful?

Mr. O'NEILL. No, Senator.

Senator BROOKE. I have just one question. Have you considered any State legislation? Have you made any recommendations to the courts, and has the legislation passed?

Mr. O'NEILL. We have a measure pending. It is at this point a perennial measure, Senator. It has been filed by State Representative Kendall of Falmouth. It calls for a State oil liability fund determined by a tax on the bowhead, captioned after the main State legislation which is currently in existence. We would like to think that with all we are forced to understand in the current days that this legislation will have a very good chance of passing, and it will have an opportunity to deal with their problem, at least up to the 3-mile limit. So I think that answers a fraction of the problem.

Senator BROOKE. How much money would be in there?

Mr. O'NEILL. $10 million.

Senator BROOKE. $10 million?

Mr. O'NEILL. Yes, sir.

Senator BROOKE. Well, I hope you are here when Mr. Train testifies about proposals that the President made to the Congress sometime ago regarding a domestic fund of $200 million that had the Congress passed, we would not be in the predicament that we are in now, and it would have been contributory. So it might be good.

Mr. O'NEILL. The only other thing I would like to add is that I would like to have Evelyn Murphy, our State Secretary of Environmental Affairs, to have an opportunity to address the application form calling for a national disaster because I think she has more specificity that ought to be given an opportunity to be heard.

Mr. STUDDS. Let me just reassure you legislation is being introduced in the first week of January at considerably higher liability than you are speaking of.

Mr. O'NEILL. Thank you, Congressman Studds.

Senator PELL. No questions.

Mrs. HECKLER. No questions.

Senator KENNEDY. You are more than welcome to remain with us, too, if you like.

Next, could we hear from the Coast Guard, Rear Admiral James Stewart, district commander, First Coast Guard District; Captain Frederick Schubert, chief, Marine Environmental Protection Division, Office of Marine Environment and Systems. I want to extend a warm welcome to you gentlemen.

I think, as has been pointed out by those who have spoken, both on the panel and our witnesses, any comment about the authority and the

responsibility of the Coast Guard should in no way take away from the extraordinary individual acts of heroism displayed by the men who are out on the line and who are facing some of the coldest seas and highest and most dangerous waters that exist in any ocean in the world.

PLAUDITS FOR HEROISM AND ASSISTANCE OF COAST GUARD

I think all of us are uniform in our admiration and respect for those men. I think, as we go through our hearing, we will get into the questions of responsibility of the Coast Guard for promulgating safety regulations and review what might be additionally useful and what has been learned from this experience that might be avoided. I pointed out, in my opening statement, we have the equivalent of this ship coming into Boston Harbor every day; and I think we will hear testimony from the fishermen that they see these ships all over the sea lanes every day and every night.

I think we could find more examples of ships that are as weakly structured as this one which are entering Massachusetts ports.

We are concerned about what can be done immediately and what can be done in the future to make sure that this is not going to happen again.

We are uniform in our respect for what is being accomplished by some very brave men and women in the service.

We only had to be reminded by my good friend, Senator Pell, who is always fighting, as you well know, for good appropriations, for the Coast Guard. We have experienced in the past the diminution of various Coast Guard services in our own State, services which I think all of us who are close to the sea and love the sea find absolutely essential to a maritime State. So we want you to know that you are welcome here, and we hope that you will communicate to your men and women who have been involved in this effort our very deep admiration.

We look forward to your testimony and then we can get on with questions.

STATEMENT OF REAR ADM. JAMES P. STEWART, DISTRICT COMMANDER, FIRST COAST GUARD DISTRICT, ACCOMPANIED BY CAPT. FREDERICK P. SCHUBERT, CHIEF, MARINE ENVIRONMENTAL PROTECTION DIVISION, OFFICE OF MARINE ENVIRONMENT AND SYSTEMS, U.S. COAST GUARD

Admiral STEWART. Thank you very much, Mr. Chairman, Congressman Studds, Senator Brooke, Senator Pell, Congresswoman Heckler and Senator Chafee.

I do not have a prepared statement to start out with here, but I would like to go through a few of the things that occurred on the morning of December 15. At about 7 o'clock, we all know that the *Argo Merchant* went aground. We know that she had radar, radio direction finder, fathometer, gyrocompass and radiotelephone as far as their electronics equipment is concerned.

En route to the point where she went aground, she passed not too far from the lightship at Nantucket, and it should have been possible

for her to get a position with her radio direction finder, using that single aid to navigation.

COAST GUARD CONSIDERED THIS A MAJOR SPILL FROM INCEPTION

The Coast Guard, in my office, the First Coast Guard District, conceived this to be a potential major spill from the very beginning. We activated our regional response team within about 1 hour of the grounding, before we had any details of whether there was any damage, whether there was any oil being spilled or not.

The Regional Response Team consists of members from the Coast Guard, Environmental Protection Agency, the Army, U.S. Geological Survey, Corps of Engineers, State Fish and Wildlife Service and the National Marine Fisheries Service.

We also verbally requested the services of our Atlantic strike force, which you mentioned earlier this evening, within 1 hour of the time that we knew that the ship went aground. Shortly after she went aground, the captain of the *Argo Merchant* asked for permission to pump oil over the side. He was thinking of lightening the ship, and being able to get her off that way. We denied that request, at first verbally, and then later by message. Shortly after he grounded, the engineroom began flooding, and also the cargo pumproom began flooding, and soon all the capability of the ship to generate steam had to be secured. It was a steam propelled ship, so that all she had left after about 2 hours, or a few minutes plus or minus from that, was her emergency generator.

About 10 o'clock that morning I called Washington and verbally requested the Commandant to give me authority to invoke the Intervention Convention. The Intervention Convention is an international convention of which the United States is signatory, and this allows a flag-State to take total control of a salvage operation of a vessel if they determine that a tanker has gone aground in such an area that it is in grave danger of breaking up, and if that grave danger poses a grave and imminent danger to pollution of our shores by oil. We requested that authority at 10 o'clock, that very day, about 2½ hours after she went aground. About noon that day I confirmed that request in writing, but the Commandant was already taking action to contact Liberia, the other nation involved, through the State Department and within a few hours after that, at 1500 that very same day, we had authority to invoke the Intervention Convention if we considered the owner or agent's action to be inadequate, not timely, or inappropriate, to abate the threat of pollution.

On December 16 I determined that the owners and/or their agent, had not taken what I considered to be adequate action. They had, for one thing, ordered a tug from Key West, Florida, which was not estimated to be on the scene until Monday of this week, and they had taken no action to hire a tug and a barge to get out there and be able to take the oil off. So we advised the owner and the agent and the master that we had invoked the Intervention Convention at 3 o'clock on December 16, the day after the ship grounded.

From the very beginning we really had two options here. One was to pump oil over the side quickly to lighten the ship, and to try and float her off that way.

The other one—to keep the vessel in place and pump off oil into barges—developed shortly after that, when the engineroom filled up with water. That sort of minimized our option to float her off, because we knew that there had been some structural damage between the engineroom and the cargo pumproom as a result of the flooding. The bulkhead between the engineroom and the cargo pumproom ruptured at about 9 o'clock on Thursday evening, and this put the control of flooding completely out of hand. We were not able to control the flooding at all at that point.

Since a tanker is basically supported flotationwise by compartments at the bow and at the stern—the dry storage compartments at the bow and other areas up there—the engineroom and the cargo pumproom aft—there is very little flotation in the middle part of the ship. Once you lose all that flotation after then she sank down to the bottom at that point, and the weakening there of the ship, between the engineroom and the cargo pumproom fairly much eliminated the option of pumping oil out and trying to raise her and float her off. So at that point the option really was to keep her on the bottom, and try to arrange to get barges alongside to pump the oil off, and that was the direction of our effort.

Senator KENNEDY. When did that happen? When did the aft section flood or sink?

Admiral STEWART. The after section flooding went out of control at 9 o'clock on Thursday evening, the day after she grounded.

Senator KENNEDY. When did the heating process stop?

Admiral STEWART. The heating process?

Senator KENNEDY. Heating for the oil.

ARGO MERCHANT IMMOBILIZED ALMOST FROM MOMENT SHE WAS GROUNDED

Admiral STEWART. The steam boilers on the ship had to be secured within a couple of hours after she grounded. The engineroom began flooding very shortly after that, and of course, steam is used to operate the cargo pumps, the main propulsion machinery, and is the normal method of generating electric power on the ship.

Senator KENNEDY. So sometime in the midmorning of the day it grounded the heating capability ceased, is that correct?

Admiral STEWART. Yes, sir.

Senator KENNEDY. What does that mean in terms of the ability to move, or shift the oil?

Admiral STEWART. Well, it meant that they could not operate their internal cargo transfer pumps. Basically, they could not even pump the oil over the side if they wanted to.

Senator KENNEDY. Or anybody else wanting to transfer the oil?

Admiral STEWART. Using their own equipment? We could not transfer it with the ship's equipment at that point.

Senator KENNEDY. By what time, as I understand it, it is a slow process that goes by degree?

Admiral STEWART. Well, that depends on the temperature of the oil itself. The oil has to be heated in order to be pumped ashore when the ship arrives in port. They have steam heating coils that go through each tank, and the oil, as I understand it, was at about 100 degrees Fahrenheit when the ship actually grounded.

Senator KENNEDY. What is the lowest range that it could go before it could be transferred?

Admiral STEWART. Well, I am not an expert in transferring oil, but——

Senator KENNEDY. It was probably just a few hours, is that right?

Admiral STEWART. No, this would be a matter of days. I would say, within the first couple of days the oil probably would have still been hot enough to pump off if we would have been able to get a barge alongside in a safe way.

Senator KENNEDY. Within approximately 2 days?

Admiral STEWART. I would say maybe 2 or 3 days.

Senator BROOKE. If the Chairman would yield for one minute. Admiral, at any time was burning of that oil a viable option?

Admiral STEWART. The Coast Guard has had a number of experiences with Number 6 oil, and I have been in communication with the people at headquarters, to try and decide whether we should burn it or not. It was certainly considered as an option all along. They had a spill in Chesapeake Bay. They received some drums of the Number 6 oil and had a lot of oil soaked rags and things. They wanted to burn these things in order to dispose of them. They found that they were able to burn the rags only if they had a high velocity fan that was blowing on them. After they ignited the rags with the high velocity fan they would burn. As soon as they turned off the fan, even though the rags were exposed to the air, the fire would go out. They were unable by mixing gasoline, or by using a blow torch, or any other way, to ignite the oil that was in the drum. This is what would have happened had we tried to ignite this oil in the tanks.

Basically, you need three things to burn: the fuel, which we had, you need the source of ignition, and you need oxygen, and oxygen is the primary problem in this case. In order to burn this Number 6 oil, even in a boiler, it has to be atomized, and much air has to be provided so that the droplets of atomized oil are totally surrounded with air, and then it will burn. But it will not burn in a pool.

Senator BROOKE. So you had to reject the option of burning?

Admiral STEWART. I feel that we did.

Senator BROOKE. You say that you feel that you did now. What do you mean? You did not have the three?

Admiral STEWART. I do not think, from the advice that I received, that the Number 6 oil would burn if we ignited it in the ship, and if we opened up the ship and let it go out on the surface, I am also convinced, from the advice that I received, that it would not have burned.

Senator BROOKE. Do you think it was worth a try?

Admiral STEWART. Captain Schubert has had more personal experience with this in his work at headquarters. Do you have any comments to add to that?

NO. 6 VERY VISCOUS AND LOW VOLATILE OIL WHICH MAKES CLEANUP EXTREMELY DIFFICULT

Captain SCHUBERT. Yes, sir. I think we have to recognize that this type of fuel, particularly in the position it is in, in the temperature it is in, is a very viscous low volatile type of substance. Without getting into too many technicalities, this type of substance needs about a 1 to 5

percent dilution of its vapors in order to support combustion. The volatility of this substance can be compared through the vapor pressures with other substances, and I would like to just give you an example. For instance, the vapor pressure of gasoline is something on the order of magnitude of 21 to 22 times that of this particular substance. When it is cold, particularly the state it is in right now—it is in a solid state—it is very, very difficult to burn.

It has been suggested that we try napalm on it. This was rejected, because once napalm has been burned, the oil would not burn. As soon as it cools below the temperature that is required, to put off enough vapors in order to support combustion, which is 150 degrees Fahrenheit, I might add, the fire goes out. In this condition we have a tremendous heat sink out there. If we heat the oil to the point where we can support combustion we would have an infinite amount of heat being required, which is really a technological impossibility.

It was suggested we use thermite. Thermite is a peculiar substance which provides its own oxygen. We theorized that the thermite would burn, and would soften the oil around where it was burning, and sink down into the oil. As soon as the thermite had expended itself and no longer supplied the oxygen, the fire would go out. All experience that we have had in the past in practical situations, such as the Admiral described in the Chesapeake Bay, has been totally unsuccessful.

I might add there have been other attempts by other nations to burn oil. The Canadians tried it with the *Arrow* disaster that they had. It was tried with the *Torey Canyon.* All with relatively——

Senator BROOKE. Any research going on in this field, do you know?

Captain SCHUBERT. No, sir, I don't believe there is.

Senator BROOKE. Thank you.

Senator PELL. Mr. Chairman. I would like to inject here one thought. Why was not the thought given of trying another explosive device, like a torpedo? I know I suggested this, and have been in touch with the Navy on it.

Why wouldn't a torpedo do this? I remember in World War II, when I was at sea, in even colder weather than now and saw ships in the North Atlantic, burning in the harbor, we circled the ship a day and a half, and saw it burn. Why didn't a torpedo have any value effect?

Captain SCHUBERT. Well, sir, I think that what you have here is a difference in the product that is being carried. Number 6 oil is a refined product, but it is on the low end of the scale, so to speak. It is about one step above asphalt. The products that were carried in World War II were highly volatile fuels to support the war effort, such as diesel, aviation gas, automotive gasoline, which when subjected to torpedoing would naturally explode.

In this particular case, we could compare the efforts that the British used during the *Torey Canyon.* They used a technique which they called, I believe, explosive surgery, which is to open up the tanks by bombing, and then to burn the substance inside the tanks. This did not work. They did get some burning of the lighter fractions of the crude oil in the *Torey Canyon*, but generally speaking, it was a failure. They were left with a thick, tarry substance, which is down in the area where this Number 6 comes from.

Senator PELL. I have a couple of thoughts there, though. In the first place, I think it was 20,000 tons, according to the Library of Congress, the *Torey Canyon*, were either burned, or unaccounted for. Secondly, that residue was very solid, and was not contaminating, it was more like rock. So it did not have the dreadful effects that the oil has.

I do not see why, when you are in the desperate situation we are, why one cannot try out torpedoes, used to kill things and destroy things, why not try? You cannot do any harm.

Captain SCHUBERT. Yes, sir.

TOREY CANYON SITUATION ENTIRELY DIFFERENT

Well, I—one of the things I want to clarify in the *Torey Canyon*, we had a different type of situation as far as the oil is concerned. We had a crude oil, unrefined, which has the entire spectrum of the fractions in the oil. Those parts of the oil in the *Torey Canyon* that burned were those highly volatile fractions, which result when entering refining process in kerosene, gasoline, and so forth, like diesel.

As far as trying torpedoes as a last ditch measure, I think the reasoning there, and I am speaking for Admiral Stewart, of his decision was that if we torpedo it and it does not work, we will have released even more oil. We would have even a worse pollution situation, and there was genuine concern to suspect that it would not work.

Senator PELL. It could not be in a much worse situation than you are now. I notice the suggestion was made and passed on to you, and to the Navy, and I hope it is taken. But at any rate, has any experiment ever been done with the torpedo, or would you say, these thick oil Number 6 would not burn? Do you know that for a fact? Have any tests been made?

Captain SCHUBERT. Our operational experience would dictate this, but no, I do not know of any actual tests that have been made under laboratory conditions.

Senator PELL. I do not think so.

Now, another point, and very important, there is a firm, a man who called me up, and I think he is called Mr. Paul Telley, president of *Toko* of North Billerica, Massachusetts, that he distributes a wicking agent that he feels can at least begin to clean up the oil spill by burning it. It is an industrial method, demonstrated to the Navy when he worked for the corporate company.

So why would not private industry be called in, if he has a wicking agent that can be placed in this oil, and I would hope at the end of the hearing, when all of the various witnesses have testified, Senator Kennedy might be kind enough to ask Mr. Telley for his idea, as to whether it would work, and what is wrong with his idea.

Captain SCHUBERT. Senator, I am aware of the wicking agent, and there is also a number of chemical type of solutions that were considered. I would prefer to defer to the EPA, since the EPA has the responsibility in the regional response team, and under the National contingency plan for anything where we use a chemical agent.

Senator PELL. But would you give a good hearing to Mr. Telley and his experiment? You say that is more EPA responsibility than yours?

Captain SCHUBERT. Yes, sir.

Senator PELL. It is yours, is it not?

Captain SCHUBERT. Under the National contingency plan the use of any type of chemical agent would be in fact the responsibility of EPA.

Senator PELL. You mean you do not have the authority in the Coast Guard to say the wicking agent, Mr. Telley's burn works, and you cannot invoke it yourself?

Admiral STEWART. The decision in this case, to do it or not, was the on-scene coordinator, and he works for me, and he is a Coast Guard officer. We decided—again we are talking about burning—and we did not think it would burn, based on the advice that we had.

Senator PELL. Excuse me, besides the advice, could not somebody go out and scoop some of this stuff up, and put this wicking agent on it and see if it works? That is the best way, without theoretical advice, I would think. Is that too simple?

Captain SCHUBERT. I am speaking a little bit from a lack of knowledge of just exactly what the characteristics of this wicking agent are. I know they have been tried in the past, and have not been generally successful. In this particular case I cannot comment on that.

Senator PELL. I would hope one of the beneficial effects of this hearing would be that at least you would try.

Captain SCHUBERT. Yes, sir.

Senator PELL. And I would ask the same question of Mr. Train. I would hope you would have the authority. You see, you can have the authority. I hope another beneficial effect would be to give you the authority.

NATIONAL CONTINGENCY PLAN FOR OIL SPILLS

Captain SCHUBERT. Perhaps I should describe the national contingency plan.

Under the national contingency plan there are several Federal agencies which have definite responsibilities for cleaning up and responding to oil spills. It is a plan designed to coordinate the Federal and State efforts to meet the threat. Under this plan the predesignated coordinator rests with the Coast Guard. In the inland regions the EPA has that authority.

Under the provisions of the plan certain of the agencies have very definite responsibilities. For instance, the Fish and Wildlife has responsibilities for bird feeding and caring of wildlife that have been contaminated by spill.

The EPA, likewise, under the national contingency plan, has responsibility for evaluating the use of chemical agents, and making recommendations to the on scene coordinator, and that is what I was referring to in my remarks.

Senator PELL. I have taken too much time.

Senator KENNEDY. Will Number 2 burn?

Captain SCHUBERT. Yes, sir.

Senator KENNEDY. If that was a ship full of Number 2 would it burn?

Captain SCHUBERT. Number 2 would burn very well.

Admiral STEWART. I would like to comment on the fact that the torpedo idea, if we would have used that, the ship still would have

been intact, and our hope was to get off without any pollution. Once she had broken up, of course, that option disappeared.

Senator PELL. But you still have three portions of it, and you could try with the one that is grounded. You could float the forward portion off, but the stern portion is still grounded.

Mrs. HECKLER. Admiral, is it true that the *Argo Merchant* had been cited for violations of section 311, or other statutes earlier, had you had prior record, or has this vessel had a prior record that you were aware of?

Admiral STEWART. Yes. In August 1975 we received a report from the Captain of the Port of Philadelphia that the *Argo Merchant* had leaked some oil while she was loading in Westfield, New Jersey.

Mrs. HECKLER. In August 1975?

Admiral STEWART. In August 1975. It was not a very large amount of oil. They put us on notice, because Boston was the next port of call for her, and when she came to Boston we boarded her, out in Broad Sound. We did find a little oil coming up. We brought her in to Castle Island, and put an oil boom around her to contain any oil that might be spilled. They sent a diver down who was not able to find the source of this oil.

She did sail from the port after that, and this was, to my knowledge, the first time she had come back to the port of Boston since then. Because of that incident, and because we had no definite knowledge that she had corrected it, we planned an overflight of her when she was going by Provincetown, up at the point of the Cape, and we had people who were going to board her outside Bakers Island. If we had found her leaking we would not have allowed her in. We never did get to that stage of the game, because she ran aground before she got up there.

Mrs. HECKLER. So that your monitoring of her passage had not begun?

Admiral STEWART. We had not begun to monitor, because she ran aground south of the Cape, and we were going to do this when she got up to the north end.

Mrs. HECKLER. Admiral, what sanctions can you impose on a vessel that is leaking, other than the requirement that the leak be ended, or technologically closed? What do you do? Are there other sanctions?

Can a vessel continue to come back into a port, and then just have this limited kind of monitoring that you are preparing in this case, ad infinitum, no matter how many times these instances occur?

Admiral STEWART. We were not going to let her come into port if they found her leaking in this case. She was cited for a violation, and a penalty of $350 was assessed, and the ship did pay the penalty in July this year. The company paid the penalty in July this year. But other than refusing entry, I know of no other sanction that we have except the penalty action.

Mrs. HECKLER. Do you feel that you have enough authority to deal with situations like this?

CURRENT OIL SPILL PENALTIES PERMISSIBLE UNDER LAW

Admiral STEWART. We can invoke a penalty of up to $5,000 for an oil spill, and we can refuse entry, and I think that should be sufficient to keep that type of ship out of our ports.

Mrs. HECKLER. If your earlier plan had gone into action, how many hours would have elapsed between the time that the action occurred and your monitoring, the inflight monitoring of the vessel?

Admiral STEWART. It would have been a very, very short period of time, because she was approaching the Cape from the south, and we were going to begin at the north end of the Cape. It was about noon of that day.

Mrs. HECKLER. Is there any proposal that you can make here for a change in policy that will strengthen your role? You are, after all, the policemen on the seas. You are the only policemen we have, and you are protecting our most vital resources and our coastline, or fisheries, as well as the economy of the country. The fact is, you are our eyes and ears. Is there anything more that we can give you? Can we give you the right of inspection?

Should you have further licenses, should you have licensing authority, should you have further ability to issue fines against different parties in addition to the master of the operator, et cetera? It seems that you are casting a passive role, and in a situation like this you almost have to wait for this magic line to be passed before you come into action, and even then your hands are tied to a certain extent. What can we do to give you, as the policeman on the beat, and in the oceans, greater control of the situation?

Admiral STEWART. Well, the way the laws are written today, we had no jurisdiction over this vessel on the high seas. She could have been going by there en route to Canada, to Halifax to deliver oil, and it would have been entirely legitimate for her to be there.

We really only have authority when you get inside the 3-mile limit, that is, inside our territorial waters. So unless we somehow extend our jurisdiction out further to the point where we can control who comes in there, I don't see how you could keep a ship like that from navigating that close to our shore.

Mrs. HECKLER. The issue can be pursued, but let us go on.

Senator KENNEDY. Yes, I would like to, because I think this is really a very important part of it.

It is true that you cannot regulate in the outer seas, but there is no reason that the Coast Guard cannot promulgate regulations to keep them out of ports all over this country. I listened to the exchange between Chairman Magnuson and Admiral Siler before the subcommittee in the hearings January 29, 1975.

> Chairman MAGNUSON. You can say it is unsafe to come in at this time, and you cannot come in until we tell you. Is that your responsibility?
>
> Admiral SILER. Yes, sir, under the Ports and Waterway Safety Act we have that authority now.
>
> The CHAIRMAN. Actually the Coast Guard can stop any ship coming in, if they say it is unsafe, can you not?
>
> The ADMIRAL. Yes, sir.
>
> The CHAIRMAN. Dry cargo if you want to?
>
> The ADMIRAL. Yes, sir, you have given us that authority.

Now that is 1975.

On March 2 and 3, 1976, again with Senator Magnuson and the Admiral:

Senator MAGNUSON. You have had the authority without this new law—referring to other legislation—You always had the authority to say to any ship wanting to come in that it could not because of certain reasons. Maybe it is an old tanker that should not be out there to begin with. It might bust up very quickly, but you have the authority.

The ADMIRAL. Yes, sir, and we have used it.

I think all of us are mindful of Monday morning quarterbacking, but this reaches to the heart of the questions about the authority of the Coast Guard, about whether you have the authority to issue regulations under existing legislation to ensure that ships which are unsafe will be kept out of American ports.

Admiral STEWART. Yes, sir, but I think again the 3-mile limit was a dividing line.

COAST GUARD CURRENTLY DOES NOT HAVE AUTHORITY TO BAR UNSEAWORTHY SHIPS FROM U.S. PORTS AND HARBORS

Senator KENNEDY. You can make sure that any of these ships stay out if they do not conform, make sure that they have adequate navigational equipment, make sure that their hulls are safe, make sure that their manpower or person power on those ships is adequately trained.

Admiral STEWART. I do not believe we have authority to do that now, sir.

Senator KENNEDY. I just read you the part where he said that if the hull was bad, you certainly could. This almost fits the very case that brings us here.

"Maybe it is an old tanker that should not be out there to begin with. Might bust up very quickly, but you have that authority," and the Admiral, "Yes, sir, and we have used it."

Admiral STEWART. Yes, sir, we would not have allowed it into Salem if we had boarded it and felt it was unsafe to let it in, sir.

Senator KENNEDY. Well, now you can promulgate regulations for ships and submit them to the Congress. Is there any reason that you cannot do that?

Look at this particular ship. It was built in 1953. 1964 propellor shaft cracked. In 1965 the generators broke down. In 1966 the cargo pump broke, 4 days to let; 1967, collision with a freighter in Japan, damaged the bow. 1967, three fires in the boiler room, towed to port; 1967, engine broke down at sea, towed to Japan. 1967, lost power at sea, towed to Honolulu; 1967, electrical failure at sea; 1968, rammed dock in India; 1968, lost power, and engineroom flooded; 1969, ran aground off Borneo, refloated without inspection; 1970, machinery broke down in Singapore; 1970, generator damage off Japan; 1971, grounded for 60 hours off Italy; 1971, generators damaged in France; 1972, lost power at sea, and towed to Venezuela; 1974, broke down at sea and towed to New York; 1976, machinery damaged in Honduras.

Now, why is it that we cannot make sure that with any ship that is going to come into our ports, you people in the Coast Guard are going to get notice of a record like that, and that you are going to take a ship like that and say, now wait just a minute. Wait just a minute. And before this ship, or any ship like that, that they are going to meet certain kinds of requirements.

We require that planes have altimeters. There is no reason that we cannot require that ships have up to date navigational equipment.

We have various health regulations that require personnel who are going to use medical devices be adequately trained, because it poses health and safety hazards to people. We require inspection of planes to ensure that they are safe. The Coast Guard issues regulations for LNG tankers coming into port. Why cannot we say that with regard to hull structures, and with regard to training of personnel, with regard to navigation equipment, that ships have to meet some minimum standards, and if they cannot, then they cannot come into port? I cannot believe for a moment that Exxon will not go out there and meet those requirements, and that the major oil companies will not comply. You and I know that transportation of the product is a small aspect in terms of the total cost for the consumer.

MAJOR SHIPPING INTERESTS WOULD LIKE AS LITTLE REGULATION AS POSSIBLE

It seems to me that the authority is there, I believe it to be based on those hearing references and my own review of the legislation. But if it is not there we ought to have that request for the authority from the Coast Guard, and I am sure that such legislation would pass. I do not minimize the power of major shipping interests that want to see as little regulation as possible. They want to make sure that ships do not have to follow certain sea lanes so they can get in a few hours earlier, and save themselves some money.

I do not minimize the power of those interests. But the issue ought to be raised. It ought to be discussed. We ought to have those people like yourselves who have demonstrated by your testimony here that you have the understanding, the know-how and the knowledge of what is necessary to protect our shores here in Massachusetts, and New England, and our country suggest to us, if you need more authority, and in what particular area you need it.

Now, we cannot expect that regulations will be written here regionally. We know it has to include your bosses. I will make sure that I get in touch with the Admiral, and indicate that to him. But I would hope that we would have your support for this kind of regulation, because I think it is basic; and I think we are facing these kinds of issues and questions every day.

One of those ships is coming into Massachusetts ports effectively every day of the year and we just want to be adequately protected.

Admiral STEWART. I would like Captain Hein to say a word here. He is the Captain of the Port of Boston, and the ship would have come under his jurisdiction.

Captain HEIN. Senator, I would just like to say what we had planned for this particular ship, knowing the past history.

As Captain in the Port of Boston, I had this overflight scheduled from the Cape Cod air station. I had told the agents that when they give us their advance notice, that I would not let it into port until I had inspected it and satisfied myself, with my inspectors onboard, that she was safe enough to come into port. I intended to have her stop and anchor outside Salem Harbor so that we could inspect her. This is under the terms of the law. I admit that the terms do not reach out 27 miles. I could not stop her there.

Senator KENNEDY. Let me just read the specific reference in the legislation; because a lot of people are going to wonder why we are not passing more legislation to protect our shores. We ought to know who has the authority.

We want to work with you. But let me just read the specific part of the legislation. This is under 391, paragraph 391–A1, paragraph 2.

"The Congress hereby finds and declares that existing standards for the design, construction, alteration, repair, maintenance and operation of such vessels must be improved for the adequate protection of the marine environment; that it is necessary that there be established for all such vessels documented under the laws of the United States, or entering the navigable waters of the United States, comprehensive minimum standard of design, construction, alteration, repair, maintenance and operation to prevent or mitigate the hazards to life, property, and the marine environment."

Then it continues under rules and regulations, "in order to secure the effective provisions for vessel safety, protection of marine environment, the Secretary of the Department under which the Coast Guard is operated shall establish for the vessel additional rules and regulations which may be necessary, with respect to the design, construction, repair, maintenance, including, but not limited to the superstructures, the hulls, the places for carrying such cargo, with respect to all materials used in such construction."

Well, it is very clear. Title 2 of this talks about operating standards, and gives a similar kind of standard. Now, I think if there is any kind of question about the authority that exists then we ought to know about it.

I just hope that when we get ahold of the Admiral down there, Siler, and we indicate this, that we are going to get support from you people. We all know that you may get the best kind of equipment and the guy could be asleep. But if you do not have good navigational equipment like loran C, and you do not have requirements that ships stay in the shipping lanes, and you don't meet minimum requirements with regard to that hull, and you are not meeting requirements for training of personnel, then the chances for this kind of an accident, I think, are predictable.

Admiral STEWART. Mr. Chairman, Senator, could I respond?

Senator KENNEDY. Yes, sure.

CAPTAINS OF THE PORT WARNED NOT TO PERMIT DOCKING OF ARGO MERCHANT 2 YEARS AGO

Admiral STEWART. It is going back a little time in history, to go back to 1975, because as I recall, after that incident we recommended to the Commandant that all captains of the ports be advised that they—the *Argo Merchant*—had this problem in Boston, and the ship not be allowed in any port, until they fixed the problem.

Senator KENNEDY. How many ships do you have now that cannot come into Boston that are trying to come in here?

Captain HEIN. We have not stopped any.

Senator KENNEDY. You have not stopped any?

Captain HEIN. We have not stopped any. We have turned some back. We have made special precautions in several instances, when we

know of a problem, we did board them, some of them—all of them we have allowed to come back in, but with special procedures, booming, whatever, if they have a minor problem.

Senator KENNEDY. Do you have any rules or regulations, for inspections of any of these ships coming into the United States, in terms of their safety, and the structure of their hull, and the rest of the navigational equipment?

Captain SCHUBERT. We do have a compliance program, which has to do with compliance with the pollution prevention regs——

Senator KENNEDY. What about navigational equipment.

Captain SCHUBERT. Navigational equipment will come under the broad authority of the Ports and Waterways Safety Act, and I might add we are coming out with regulations in the very near future which will in fact require certain minimal manning standards, such as navigation teams on the bridge when operating in confined waters, radar——

Senator KENNEDY. Give us a date on it, because your Admiral said in March, before Senator Magnuson's committee, that they would be out in April.

Admiral STEWART. We have proposed rulemaking here that is out in the Federal Register now, and it was published in May 1976, and comments are coming in on it. What is the schedule time?

Senator KENNEDY. Well, you know the point that I am making in regard to this. It seems to me that we ought to regulate with regard to those potential danger areas that affect the life and safety and the well being and the health of the American people. Clearly in this area, it is just as important. It seems to me that we ought to make sure that we get those regs out, and that they are comprehensive. And if they are not going to be, we ought to make sure that we get the legislation to make sure that they are going to be. We look forward to working with you in the fashioning of these regulations.

Congressman Studds?

Mr. STUDDS. Admiral, I know you are not in a position, and you probably do not feel in a position to be critical of the Congress, but I can. I think that one thing ought to be said for the record.

If my memory serves me correctly, some of the initial proposed regulations which you promulgated, which the Coast Guard promulgated, pursuant to the Ports and Waterways Safety Act. were a good deal stiffer than some of those that have come into effect, and to put it mildly, it drew a great deal of flack from the industry, is that a fair analysis, and that you—let the record reflect your expression, and not only that, but you did not precisely find that relevant committees of the Congress to your rescue, and insisting with some vertebra of their own that these stiffer standards be imposed on a very powerful and hostile industry for those proposed regulations. You do not have to answer that, if you do not want to.

Let that stand as a statement of mine. We will interpret your expression. But I think it ought to be on the record, that regardless of the adequacy or inadequacy of the current regulations promulgated by the Coast Guard under this act, that the Coast Guard has, in recent years and months, tried at least to float considerably stiffer proposals, and has been under extraordinary attack from the very powerful

industry, and has not been rescued to any extent by the Congress in that respect.

Let me ask you, the questions of the adequacy or inadequacy of your tanker safety regs entirely aside, would you venture a judgment that in the instance of the *Argo Merchant*, if she had met every conceivable standard we require of newly constructed U.S.-flag tankers, if she had double hulls, and segregated ballast, and separated—every sealed compartment, every requirement that we could think of, had she grounded as hard as she did, where she did, under the conditions that she had, would she still have broken apart?

Admiral STEWART. I do not know if she would have broken apart as soon as this one did, but I would stay that any vessel that went aground, where she did, would eventually break up.

Mr. STUDDS. In other words, Senator Kennedy's point that you can go just so far with technology, and then you get to the human factor which is a very critical one.

Admiral STEWART. Well, the sea has some very powerful forces. This vessel was essentially grounded amidship. She was in what we call a hogging condition, with her bow and her stern hanging down—high centered is another way of expressing it—and the seas were working on her, and I am certain that any ship would break up eventually in a situation like that.

Mr. STUDDS. It is, as you know, a sobering thought to many in Washington that there are higher powers. May I just ask you one other question?

If I understand correctly, my conversations with yourself and other officers in the Coast Guard, you do not feel under existing law that you have the authority to conduct a full investigation of this incident, is that correct?

COAST GUARD DOES NOT HAVE AUTHORITY TO INVESTIGATE THIS INCIDENT

Admiral STEWART. That is what I believe. I think that the advice that I have here again from my legal staff is that this happened outside the U.S. waters, on the high seas, and that we have no jurisdiction to investigate the case.

Mr. STUDDS. Or to compel, say, the attendance in court of foreign nationals involved?

Admiral STEWART. Yes, sir.

Mr. STUDDS. Well, we needed even more critical evidence of the need to extend, as the legislation in the last Congress would have done, and I think given this incident, we can now say that the new Congress will now do this kind of authority to 200 miles in advance of granting of liability on the part of the companies if they are going to enter American ports. If they are going to enter American ports, they are going to sign certificates of financial responsibility, conceding liability, and perhaps we can avoid this. Thank you.

Senator KENNEDY. Did he have a loran on that ship, loran C?

Admiral STEWART. To my knowledge, no.

Senator KENNEDY. What was the navigational equipment they had on it?

Admiral STEWART. They had radar, radio direction finder, fathometer——

Senator KENNEDY. Was the radar working?

Admiral STEWART. I do not know that. The master was very tight-lipped. We asked him a few questions. All he would tell us was he was on a course of 320 when he went aground, and that it was an error in navigation.

Senator KENNEDY. When was the last navigational fix, do you know?

Admiral STEWART. I do not know that.

Senator KENNEDY. Well, we do not know what navigational equipment was on there, and you do not know what was being used?

Admiral STEWART. That is right, sir.

Senator KENNEDY. Why—do you know why the airlines require basic kinds of navigational requirements for the airlines that all of us fly on?

Admiral STEWART. I am sure it is for safety of flight.

Senator KENNEDY. Do you not think it would be generally useful to set some minimum standards for ships?

Admiral STEWART. That is the intent of this regulation here, and the equipment that will be required by this regulation includes marine radar, gyrocompass, magnetic compass, rudder angle indicator, depth sounder, equipment for plotting relative motion, and it has requirements in there that these things be used, not only be aboard, but be used. This will be applicable to each self-propelled vessel of 1,600 or more gross tons when it is operating in or on the navigable waters of the United States. Again, that is basically within the 3-mile limit.

Senator KENNEDY. Why do we not do the same thing for the ships coming into Massachusetts ports that Logan does for planes? Put them on a transponder system, so that you know if they are in the ship lanes, you know whether they are on course or off course, you are in touch with them? Would that be generally useful?

PUGET SOUND HAS VESSEL TRAFFIC SERVICES

Admiral STEWART. I am not really qualified to answer that question.

Captain SCHUBERT. This is a little out of my area, but we do have vessel traffic services in some ports of the country today, where certain requirements for their use is mandatory, for instance, in Puget Sound there is a requirement to use vessel traffic service.

Senator KENNEDY. Is that inside or outside the harbor?

Captain SCHUBERT. Inside the harbor.

Senator KENNEDY. Well, I am talking about outside. Everything coming into Boston. We have control of the approach, for air traffic, and for landing instructions. Planes have to hook into the system. If they get off course, they receive instructions for getting back on course.

Why not require ships to do the same to make sure that guy is awake and not asleep?

They may have all the electronic equipment in the world, and they may not be using it. But you can make sure; you get somebody that understands those things, and reacts when they see ships off course. It seems to me, particularly in the coastal areas which have been filled with such hazards from the earliest times, as the Cape Cod area has, it would be useful.

Admiral STEWART. Well, that would be a very expensive system if you are going to cover the area from Nantucket Shoals clear on out to, let us say——

Senator KENNEDY. What! $160 million has been the estimate for the cost of this particular disaster. How many of these are we going to have before this is corrected? Do you think it is worth more than a B-1 bomber?

Admiral STEWART. I am not competent to answer that question.

Senator KENNEDY. No, well, that is not a fair question. I think you get the point.

Senator PELL. I just have one thought here. You earlier said that Number 6 oil does not burn. Well, I have some pictures that I have asked the Chairman to put in the record of the hearing, showing colder climate than ours, 12 miles north of Stockholm in winter, surrounded with ice, where Number 6 oil is being ignited by the substance in this bag.

Senator KENNEDY. Keep that bag over there.

Senator PELL. Thank you.

I know you say it is the Environmental Protection Agency responsibility, I have the same question for them. But these people called you on Saturday, your office, and you said you did not refer them to EPA, and you never called them back.

I am wondering if you could give them a fair try. Get some Number 6 oil and pour this stuff on it, and see if it burns, and if it does work, try it in Rhode Island.

Admiral STEWART. Yes, sir, I will.

Mr. STUDDS. In Rhode Island.

Senator PELL. I would ask unanimous consent that these pictures be made a part of the record, included in the record.

Senator KENNEDY. This will be included as part of the record in an appendix.

Senator-elect CHAFEE. Admiral, if you could have your wish, and anything that you wanted from the Federal Government to help you in this present circumstance where we are tonight, in controlling this spill, is there anything you would ask, that you have not gotten?

Admiral STEWART. Frankly, I do not think that any forces that man has at the present time could do anything with it. We have some Number 6 oil here in a briefcase.

Senator KENNEDY. Let Senator Pell go out with it.

Senator PELL. I am willing to go out in the men's room with it and try it. Do you have some?

Admiral STEWART. Yes.

Senator PELL. Good. Well, I have Mr. Telley, if we could have one of your junior officers try it.

Admiral STEWART. If the building is here tomorrow morning.

Senator PELL. In the head. We have got the oil, and we have got the stuff, let us try it.

Senator-elect CHAFEE. Why do you not try it on the 25th floor?

Senator KENNEDY. We will do it maybe after.

Admiral STEWART. To continue with Senator Chafee's question, we, of course, have been trying to develop over a number of years the R. & D. to handle oil spills, and I think we have a reasonably good handle on it in the harbor area.

When you get out on the high seas, where you are 27 miles from any land, any protection, any lee at all, and in an area where the winds are as strong and variable, and continuous as they are in the area of Nantucket Shoals, it is a very, very difficult problem.

POSSIBILITY OF USING NAVY OIL SKIMMERS NOT FEASIBLE

Senator-elect CHAFEE. Do I understand there are two Navy oil skimmers in the proximity of your control now?

Admiral STEWART. We have four now. But again, out there in that kind of water-turning to Captain Hein—what sea state are these things designed to work in?

Captain HEIN. Four or five foot.

Admiral STEWART. Four or five foot seas, and our problem has really been when the wind was blowing hard and the seas were bad, that is when the majority of the oil comes out. Once it is out, and miles and miles away, there really is no way of containing it, and using these we are talking [turning to Captain Hein] what is the capacity of them?

Captain HEIN. They hold about 28 barrels, and you could put a barge alongside of them to pump them into——

Admiral STEWART. We are talking about 27,000 tons.

Captain HEIN. It collects 570 barrels an hour, or 400 gallons per minute.

Admiral STEWART. So really they are ineffective for the high seas environment.

Senator KENNEDY. Do you want to hold up that Number 6 oil, so that we can get a look at it? [Container of No. 6 oil held aloft.]

Admiral STEWART. We have a videotape here. I do not know if you want to see it. It contains some tape each day that we were out there. It shows the conditions, the climate that we were operating in.

Senator KENNEDY. How long is that?

Admiral STEWART. I said to keep it at 10 minutes. I am not sure, but it is probably pretty close to that.

Senator KENNEDY. Well, I think we have Mr. Train, who is head of the EPA. Maybe what we could do is just hold that. If you could stay with us, I would like to get Mr. Train, and then maybe we can. If there is time show the videotape.

Why not just hold that up and try to resist Senator Pell from throwing something on it. Could you pour it?

Captain SCHUBERT. It is very, very messy stuff to pour out.

Senator KENNEDY. Put it on the——

Captain SCHUBERT. Perhaps if I put it in one of the glasses, maybe we could sacrifice one of the glasses. This is at room temperature, remember, if it is at the temperature out there, it is a solid mass. You can see how gooey it is.

Senator PELL. Is Mr. Telley in the room by any chance? Would you be willing to try your experiment with a little bit of this glass?

Mr. TELLEY. I am afraid you would create a lot of smoke, which would be a hazard, in the area.

Senator Kennedy. Well, we cannot have that.

Well, would you seriously get together with Senator Pell and Mr. Telley, and maybe we ought to explore that maybe even later this

evening, after this hearing; and we would be interested in the results. OK.

Thank you very much, and we will see if we can maybe see the film after. But I would like to hear from Mr. Train first. Mr. Train, would you be good enough?

We want to welcome Mr. Train who is the Administrator of the Environmental Protection Agency. We know you have spent a good deal of your own time, energy, and effort following this situation. We look forward to your comments and what we might expect from your agency in the way of assistance.

STATEMENT OF HON. RUSSELL E. TRAIN, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY KENNETH BIGLANE, DIRECTOR OF OIL AND SPECIAL MATERIALS CONTROL, ENVIRONMENTAL PROTECTION AGENCY

Mr. TRAIN. Thank you very much, Mr. Chairman and members of the subcommittee.

I congratulate you, by the way, on holding this hearing. I think it is very important to focus public attention on this problem.

I am accompanied by Mr. Kenneth Biglane of EPA, and who is the Director of our Division of Oil and Special Materials Control, who has had a good many years of experience in dealing with oil spill problems.

I have a prepared statement which has been distributed, I believe. It was written fairly hastily this morning, and just typed. I am going to skip the rhetoric.

Senator KENNEDY. We will include it in its entirety.

Mr. TRAIN. Thank you, sir.

I do not think I need to express my concern, or anger, or outrage and frustration, or whatever, about this problem, and I would like to go straight to what seems to me to be some of the things that you might want to consider, both by regulatory and legislative action to prevent this from ever happening again. A number of these things, I am happy to say, have already been touched on by the members of the subcommittee this evening.

Whatever the tragic losses which may arise from the wreck of the *Argo Merchant*, if we can learn from that experience and develop more effective measures for the future, the disaster will not be without its benefits, as severe as the courts have been. In 1973 I cochaired with the Commandant of the Coast Guard, the U.S. Delegation to the London Conference, which adopted the Comprehensive International Convention on the Prevention of Pollution from Ships. That convention establishes construction and design standards for future tankers, and deals with the problem of the intentional discharge of oil and oily wastes at sea.

Senator KENNEDY. Has that been submitted to the Congress?

Mr. TRAIN. It has been submitted, but it has not been ratified. The Convention was by no means as stringent in its standards as the U.S. had thought. For example, we sought double bottoms.

A proposal which had little or no support from other nations at the conference. This particular Convention has not been ratified by

the U.S., and indeed, remains largely unratified by any of the signatory parties. While this represents some speculation on my part, I suspect that failure of ratification has been motivated in part, at least, by the desire to wait and see the outcome of the Law of the Sea negotiations.

At the same time, and parenthetically, I am compelled to note that the parties which signed the Convention in London, have pointed to the regulatory standards and requirements contained in the Convention as an argument against coastal State regulatory requirements in the Law of the Sea negotiations, while at the same time, continuing to fail to ratify the very Convention whose terms supposedly support this argument. Thus, one is forced to conclude that we are in danger of obtaining no effective international regulation in this area, either through the Law of the Sea, or through the 1973 Convention. In 1969, an International Convention on Liability for Oil Pollution Damage was adopted.

Mr. Chairman, I may be wrong on whether that Convention has been actually submitted for ratification.

Senator Pell. It has been, and the Senate has not passed it. It should have passed it.

Mr. TRAIN. I had second thoughts as I was answering that question. To protect the record, and I think I am wrong, I do not believe it has been submitted. In 1969 an International Convention on Liability for Oil Pollution Damage was adopted, which would allow recovery of damages from the shipowner of approximately $160 per gross registered ton, up to a maximum of $16.8 million from the owner or operator of a vessel. The Convention is in effect, and has been ratified by Liberia, the flag country of this particular vessel, but not by the United States. Accordingly, we cannot invoke its provisions. However, it is fair to point out that I understand the fact that the ship lies outside our waters, in international waters, would preclude our recovery under the Convention even if we were a party to it.

I should point out that President Ford submitted extensive enabling legislation in the last Congress, which would have permitted ratification of these last two Conventions. The legislation was not acted upon, and the same legislation proposed by the President also contained a proposal for a $200 million fund to compensate for damages from oil spills made up of charges against importers. This legislation was entitled the Comprehensive Oil Pollution Liability and Compensation Act.

Mr. STUDDS. Mr. Chairman, if I may interject for just a moment. I want to congratulate Senator Pell, who, as I understand, is the ranking member of the Senate subcommittee that is, I think, and I hope, proudly responsible for the fact that we have not enacted that enabling legislation.

I certainly led the fight in the House to counter the President's proposal. That statute, I must say in all fairness, points out, that enabling legislation proposed by President Ford, not only has been ratified by Liberia, which ought to give us some pause, and very few other countries in the world, as to why they find it particularly attractive, and not, thank heaven, by the United States, but would in effect lower existing liability for U.S.-flag vessels, and no wonder it was so strongly supported by the industry.

CONGRESSIONAL MEASURE WOULD CREATE A 200-MILE BUFFERZONE AROUND U.S. WATERS

Our counterproposal, which is what the Senators have been talking about, which is a much stiffer law, would establish a fund, would be effective after 200 miles, and does not have the enthusiastic support of either the industry or Liberia. I just wanted to make that clear.

Mr. TRAIN. I touched on the 200 mile matter myself.

Mr. STUDDS. I appreciate that.

Mr. TRAIN. The present Federal Water Pollution Control Act, and other statutory authorities only extend to the waters over which the U.S. has jurisdiction. It has been suggested by some that the U.S. unilaterally establish a 200-mile pollution zone off our shores.

Since the Law of the Sea negotiations have been designed to develop internationally applicable rules, and to avoid a diversity of conflicting unilateral actions around the world with all the attendant potential adverse impacts on freedom of navigation, the U.S. has consistently opposed the establishment of such pollution zones by other nations, and refused to take such an action at home. Realizing that marine pollution does not respect political boundaries, the Environmental Protection Agency has been supportive of this overall U.S. position.

However, it seems to me that given the increasing uncertainty of the outcome of the Law of the Sea negotiations, we might do well now to reconsider our unilateral options. Aside from the question of unilateral action to establish a pollution zone, the U.S. has clear authority to set a wide variety of regulatory requirements with respect to vessels entering U.S. ports.

We have generally been reluctant to set such special rules, particularly those involving design specifications, again because of concern over similar and possibly differing actions by other countries. However, here again, it seems to me that the time may well have arrived when the U.S. should reassess this position, and assert by statute and regulation, a more aggressive approach for setting standards designed to protect our own shores and our own workers. I might add, I think probably ample statutory authority does exist.

All tankers, whether new or existing, which use U.S. ports should be held to strict standards of design, construction, operation, maintenance surveillance, and boarding.

I have suggested informally over the last several days that we—and part of that was here in Boston on Monday—that we explore the feasibility of establishing technological surveillance of vessels approaching our shores. A wide area of technologies are available today, including satellites.

I recognize that a ship such as the *Argo Merchant* was in international waters and, thus, outside the U.S. regulatory jurisdiction. Nevertheless, it would seem to me entirely appropriate, and not to give rise to any jurisdictional issues, were we to plot the course of such an incoming ship, using such sophisticated technologies, particularly in sensitive waters such as those involved in this case, and take appropriate measures to notify the vessel of its danger and of its proper course.

Let me make abundantly clear that, while most of the matters I have been addressing are of deep and continuing concern to me, and

to the Environmental Protection Agency, most of them fall within the particular field of expertise and statutory responsibility of the Coast Guard.

I have not had an opportunity, in the brief period of notice before this hearing, to explore any of these proposals with the Coast Guard, nor have I had any opportunity to seek an administration position, I think you would understand. Thus, the suggestions must be taken as largely personal, or as those of EPA. They are put forward primarily to suggest directions for preventive action.

In this connection, it is apparent that we are dealing here with a plethora of international conventions, many of which remain unratified, domestic legislation, and ongoing negotiations of uncertain outcome. A number of Federal agencies are involved and, of course, there is a vital interest in all of these matters on the part of our coastal States.

NATIONAL POLICY ON TRANSPORTATION OF OIL BY SHIP NEEDED

It seems to me that there is a crying need at this juncture for a comprehensive and coordinated look at all of these matters with a view to the prompt development of a comprehensive national strategy for dealing with the transportation of oil by ship.

With this in mind, it is my expectation to recommend to the President the establishment of a commission, I call it a commission, call it a task force, or whatever, chaired jointly by the Coast Guard and the Environmental Protection Agency, including other concerned Federal agencies and representatives of the States, to undertake this task on a priority basis. And being before this body, I certainly do not intend to exclude the Congress, but since I am suggesting a presidential action, it seems this format was appropriate.

Obviously, any such Governmental group should provide an effective mechanism for consultation with the affected industries, labor, scientific communities, and the public generally.

That concludes my prepared remarks.

Thank you.

Senator KENNEDY. I think that is an excellent statement, Mr. Administrator, and I think it is one which I hope will be speedily followed up. I wish you well in terms of the development of those recommendations.

One of the other hats that I wear in the Congress is the Chairman of the Office of Technology Assessment, and the OTA did a study of oil transportation by tankers and an analysis of marine pollution and safety. They published this in July 1975. Most of the things that you mentioned, that I have been talking about this evening, were included in their recommendations for technical improvements and regulations, and gathering of pollution and safety data. I would refer this document to your people. A lot of the basic kind of technical work has been done, which I think should expedite your handling of this particular assignment. I would make it a part of the file of this hearing. I just want to say, I think all of us are enormously impressed by your very deep personal interest in this issue, the time that you have spent here in Massachusetts, and the urgency you have expressed.

I think you have shown the enormous danger, real and potential. I think it has been a very important statement, and the comments that you have made here this evening are very constructive.

Mr. TRAIN. Thank you, Mr. Chairman. I appreciate that. Let me inform the subcommittee of one thing that has happened today in terms of agency efforts.

EPA convened here in this building at 1 o'clock this afternoon, and it ran just about the time this session began—probably some of the participants are here in the room. I do not know. There was a meeting of scientists, chaired by Eric Snyder of our marine laboratory at Narragansett, with which Senator Pell is very familiar, which brought together top scientists in this field, dealing with oil spill problems, from the Federal agencies, NOAA, the Coast Guard, and ourselves. Other groups such as Woods Hole, MIT, the University of Rhode Island, and private consulting firms, and so forth have constituted themselves an ongoing consultative body, not only with respect to this particular spill, but hopefully, trying to arrive at a damage assessment.

It is far too preliminary to even offer much on that at this time, as I am sure you can appreciate, but I wanted you to know that this is underway. Really it represents, in my mind, an excellent effort of interagency cooperation, and cooperation between the public and private sector on this problem with all these people responding practically on a moment's notice and volunteering this effort.

Senator KENNEDY. We are going to hear Mr. White from NOAA, about the environmental impact of this disaster for the fisheries.

Is there anything you can tell us about the President's response to the request of the Governor?

I know when I talked to President Ford earlier, he indicated that he had talked with you about this, and the nature of the disaster.

PRESIDENT FORD TREATING THE DISASTER ON A PRIORITY BASIS

Mr. TRAIN. I do not know that I can give you any particular answer to the request of the Governor, but I can tell you that the President is reviewing this with a sense of priority. Those who are involved with disaster assistance in the Federal Government are working on this. The President has directed me, Senator Brooke really conveyed the message, to express here publicly his sense of urgency about this problem, the fact that he cares about it, and that he had directed his Federal agencies at all levels to work together to respond with every capability they possess, to do everything humanly possible or organizationally possible to respond to the emergency that is at hand.

Senator KENNEDY. Let me just ask you just one question, and that is, what lesson do you draw from this about offshore drilling and the dangers to marine resources?

Mr. TRAIN. Probably several. One, the spill brings home to all of us probably what really does not need to be brought home. The fact is that you cannot deal with oil without occasional problems. Sometimes very severe, as in this case.

I think it is also apparent that the transportation of oil by tankers in relatively close in coastal waters, just has built in risks, and to the extent that those risks can be minimized, or to a portion offset by off-

shore production of oil, and the transportation of that oil by pipeline below the surface of the bottom, below the bottom, I guess, I think you then have very possibly both environmentally and economically desirable alternative, given the assistance on the best available technological systems, tougher surveillance and enforcement, very important, the surveillance agencies of the Federal Government must have the resources to do that job.

In assessing the particular Georges Banks lease sales proposal by the Department of the Interior, the Environmental Protection Agency has a draft environmental impact statement has classified it is inadequate, and referred it to the Council on Environmental Quality.

We have particularly proposed the elimination of some 47 leased tracts from that sale, and I was going to say, coincidentally, but really it is not coincidentally, it is because of the particular sensitivity of the area, those 47 tracts lie in the direction of where this wreck took place, on the western side of the proposed lease sale area.

We still would maintain strongly that that position, there has been no final determination as yet on that matter.

PIPELINES SHOULD BE USED IN THE BOTTOM

We also propose very strongly that pipelines be used in the bottom, rather than tanker transportation. There are problems with this, as I understand it.

Senator KENNEDY. Should it be permitted if you are going to have tanker transportation?

Mr. TRAIN. That is a judgment that is hard to jump to. It suggests to me that more time should be taken, Mr. Chairman, to assess this particular lease sale and review it in light of this particular spill, in light of the kind of work that the scientific group that I referred to this afternoon is undertaking, in light of the monitoring work that NOAA and other agencies are moving ahead with, out there right now, before final decisions are made.

I think that would be a delay, perhaps not very lengthy delay, but delay which would be very well worth undertaking.

Senator KENNEDY. All right.

Mr. Studds?

Mr. STUDDS. Thank you, Senator.

Mr. Train, I want to echo Senator Kennedy's appreciation of the concern evidenced by your personal presence here in Massachusetts the past few days. It has meant a great deal to a great many people. I wish you had been Secretary of the Interior also for the last 4 years.

Mr. TRAIN. I have had enough trouble finding it——

Mr. STUDDS. I have to ask the Chairman's permission and your's to make one brief aside. I must leave now, and it is not entirely for fear that Senator Pell may blow up at any moment.

I particularly have to express my feelings of regret to the spokesmen who follow, particularly those of the fishermen. I have to be in New York at an ungodly hour tomorrow morning to talk about this very subject on a network program, and I want you to know that one of the spokesmen for the fishermen on Cape Cod is on a competing network early morning program, and I do not know how he plans to get

to New York, but I am stuck with an airplane. So if my colleagues will forgive me for the premature departure, and again, Sir, I thank you for bringing, what is perhaps yourself and Admiral Siler, the highest level of Federal presence physically, that the dedicated concern that was very much needed and appreciated.

Mr. TRAIN. Thank you.

Senator KENNEDY. Senator Pell?

Senator PELL. Thank you, Mr. Chairman.

I want to turn for a moment to the two questions I raised. One, what would be your view, and I think you know the personal admiration, professional admiration, and affection that I have for you, Mr. Train.

What would be your view if a torpedo was used? Would it have any impact?

Mr. TRAIN. I do not think you heard my aside, that as you were saying what I fine fellow I was, I said to my associate, now here comes the torpedo.

Senator PELL. Quite seriously, I would just be interested in your reaction. It has never been tried, and I am just curious, would it generate enough heat to do the job?

Mr. TRAIN. Frankly, I know nothing about it, whatsoever. Which does not keep me, being from Washington, from hazarding an opinion.

I think that the point made earlier, that if it did not set fire to the oil, and the oil did not then stay afire, that it could have a very destructive effect in terms of spreading the oil all over the lot. Breaking the ship up completely, all of this at a time when there was hope, and I am assuming you were thinking of earlier on, when there was some hope of salvaging the oil and the ship.

I think you would be running a very high risk in such an experiment, frankly. But that is really a nonexpert opinion.

IS SETTING THE OIL AFIRE FEASIBLE OR PRACTICAL?

Senator PELL. Now, I would like to return to the question of setting it afire, and this is not a new idea. I have a paper here that was put out by the Federal Water Pollution Control Administration, the Department of the Interior at the time when you were Under Secretary of the Department of Interior, saying the concept of setting afire oils which are spilled, et cetera, is potentially attractive, and then it goes on to say that—describes especially treated fine silica, which increases capillary action, aided in sustaining and controlled burning.

Neither product, so far as is known, has been applied in large scale, and that would account for the fact that the logistics of application of our residue was unknown. That was 5 years ago.

Now, I have here apparently the experiments that have not been done. I have a paper written by Mr. Biglane, by coincidence, who is with us at the stand today, and if I can find my place, here we are, you said burning of oil by special methods and materials seem to offer an attractive, and perhaps inexpensive method of eliminating large amounts of oil over a water surface, provided, of course, that many significant hazards are also recognized.

Well, in view of these views, one by—in the Interior Department

5 years ago, one by Mr. Biglane more recently, what is the reason why what we have done in Sweden, where you have floating ice, the water colder than here, Number 6 oil floating in the harbor, being burned, why is it we have not tried the same thing, to see if it works?

Mr. BIGLANE. I was at the scene of the Footwater tanker and casualty in 1968 in Panama. The Smithsonian Institution in those days wanted to try and burn oil, which was a mixture of diesel and number 6, which came from this catastrophe. We utilized some of the wicking agents, or tried to, in those days, and it just did not work. Burning techniques are not widely used in the world, that I know anything about, and we try to keep abreast of this kind of technology.

What you run into here, you have got blobs of oil, Number 6, float in a neutral buoyant fashion right at or below the waterline. If you would look at this oil from an aerial posture, you might see a size of oil the size of a garbage can lid, for instance, but under that patch would be perhaps a blob 30 feet in diameter.

Now, it is difficult for me to understand how one could apply any kind of whiffle dust to create a combustion at the surface of the sea in 6 to 8 foot seas. I think one just has to go there to see what kind of condition that we are experiencing. That to maintain a patch, if you will, of wicking agents to support combustion of the number 6 oil, over the areas that I have observed, would just be impossible.

Senator PELL. Well, would you be willing to participate in a demonstration afterwards with the Coast Guard, and with the people who have done this in the past, and to see if it works?

Mr. BIGLANE. Yes, sir.

Senator PELL. One of the problems I have been informed, is in Senator Kennedy's lap. I am afraid you cannot set a fire in Boston without a revolution, without the permission of the fire department.

Mr. TRAIN. This clearly indicates a clear violation of quality air standards.

Senator PELL. Obviously that is less severe than what we are going to suffer from the oil.

I do not really mean to be funny here. I am dead serious, trying to get this idea, and giving a serious test.

Here we have a paper from the Government, 5 or 6 years ago, and it has not been given a test, and maybe this would spur it on, and if does work, maybe we could use it now on this ship that we are talking about now.

Mr. TRAIN. Let me straighten one thing for the record, I hope, and that is that we would be happy to work as you have suggested, with the Coast Guard, and any others on this. Our research efforts with respect to cleanup chemicals has been not really directed to the efficacy aspect, which has been a Coast Guard matter, but to ensure that there were not offsetting adverse environmental effects from the use of the detergents, from the disbursal of the oil. We have always recommended against the use of detergents, that they do result in breaking up the oil, and it is sinking down to the bottom with long term ecological effects. That is the kind of research that we have had particular jurisdiction to concentrate on.

Senator PELL. It is a question of wearing one bad against another bad. One evil against the other. The greatest danger now is this slick,

or whatever it is. Earlier the Coast Guard said that the responsibility rested with the EPA for testing this, and now you believe that it rests with the Coast Guard. Where does it really rest?

EFFICACY TESTING BELONGS TO THE COAST GUARD

Mr. TRAIN. In my opinion, efficacy testing belongs with the Coast Guard. The environmental or ecological side effects testing belongs with us, but we are not going to play jurisdictional games. We will work with the Coast Guard on this, I can assure you.

Senator PELL. I would invite that to Admiral Stewart's attention, because earlier you said it did not fall under your jurisdiction.

Admiral STEWART. Well, I did not say that. I think Captain Schubert made that statement. But we will test out this thing, and we have a test facility down in Mobile——

Senator PELL. Well, let us not send it down to Mobile. We have a thing off our shores. By the time you do that a week will have gone by. Can you not do it tomorrow morning and test it?

This is a typical Government approach. Let us send it to Mobile and test it, when we have the oil floating around off our shores.

I do not mean to send it to Mobile, I meant test it in here, in New England, tomorrow, today, does that seem too much to ask?

Admiral STEWART. We will try it tomorrow.

Senator PELL. Cannot you make it a commitment, you will?

Admiral STEWART. I will try it tomorrow.

Senator PELL. You will?

Admiral STEWART. I will try it tomorrow.

Senator PELL. Good, thank you.

Mr. TRAIN. May I point out that it is likely, I am not stating this as a fact, but it may well be that much of this oil is below the surface. and that is something that we all have to bear in mind, in terms of remedial action.

Senator PELL. I recognize that.

Mrs. HECKLER. Mr. Administrator, I would like to clarify the exact jurisdictional authority, which this is.

I gain the impression from the Admiral that you, as the Administrator of EPA, would have had a virtual veto over the use of a chemical to dampen, or to deal with the oil spill, that you would have had the ultimate decision on whether or not the Coast Guard could go ahead, had it decided to choose the burning option, is that a correct impression?

Mr. TRAIN. We certainly possess an effective veto, either by statute—I think by statute, over the use of a chemical such as a detergent disbursement for the reasons I stated earlier.

As to the use of burning, I would believe and assume that while there may be a technical veto, I cannot conceive that the Environmental Protection Agency would exercise any veto over efforts to try to burn the oil.

I am not saying that we would recommend it, because I have not any idea, and I would tell you to accept the Coast Guard's judgment, but I do not believe that we would be aware of any adverse environmental effects that would offset the desirability of destruction by burning, if it were not.

Mrs. HECKLER. Now, would the proposed wick substance which Senator Pell has been talking about, would that have created the consequences in which you would have had this veto, and felt that there would be a disbursement or detergent effect on the ocean?

Mr. TRAIN. Speaking without a great deal of knowledge about the wick system, I doubt very much whether there would be such effects that would bring our veto into play. Just a matter of efficacy, and a decision by the Coast Guard, as to whether it should be tried or not.

Mrs. HECKLER. Mr. Administrator, I am particularly, I really want to compliment you on your testimony, I feel that you offered us the most specific direction which we might follow, and pursue in the Congress.

I also like your idea about the presidential commission, but wondered if you had a specific timeframe in mind, because commissions can go on for years. Was there a specific time that you wished to have them report back, of course, we understand this little date of January 20, that does enter on the calendar. But ideally barring the political facts, in what period would you think a commission of this magnitude could report that?

Mr. TRAIN. I did use the phrase purposely to undertake this task on a priority basis. Probably being a little uncertain as to exactly what timeframe would be appropriate, but trying to convey that I was not talking about a long term study, which we are all too familiar with. It is something that would be undertaken as a matter of urgency, and I would think that we would be in a position to recommend to the Congress, legislative action certainly in this session.

Hopefully, early enough in this session to permit at least public hearings. I know it takes a while to get legislation through.

Mrs. HECKLER. Thank you, Mr. Chairman.

Senator KENNEDY. Just a final one.

Do you believe the accident raises any questions concerning the construction of deepwater ports, two of which were recently approved by the Secretary of Transportation?

Mr. TRAIN. I am inclined to believe that accidents of this sort tend to reinforce the position that I have taken now for some years, and that is that deepwater ports, situated well off our shores, can provide with all the qualifications of the well planned, designed, sited, enforced, and regulated ports both an economically, and environmentally preferable alternative to the transportation by smaller tankers of greater number of an equivalent amount of oil, in far more sensitive coastal waters, which typically are shallower, and typically much more crowded in the navigational and traffic sense giving rise to both the dangers of grounding, such as we have just seen, or of collision.

Senator KENNEDY. Thank you very much, Mr. Train, it has been very, very helpful testimony. We look forward to working with you. Also, your representations have been very constructive.

We still have quite an extensive witness list. The hour is late. This hearing has been held now for 2½ hours, and we still have seven more witnesses. So we will try and be fair to our witnesses, but we will ask them to proceed with dispatch. We would like to conclude by 10 o'clock.

83-526—77——4

[Prepared statement of Russell Train follows:]

PREPARED STATEMENT OF RUSSELL E. TRAIN

My reaction to the tragic and disastrous wreck of the *Argo Merchant* off Nantucket is a mixture of anger and frustration. One can only react in anger at the evidence of apparent human negligence and faulty navigation that reportedly put the vessel 10 miles off her course and into the shoal waters where she ran aground and finally broke up. One must also be outraged about the potentially disastrous impact on fishery resources, on the livelihood of the thousands of men and their families who are dependent upon the fishing industry, upon the birdlife as well as rare and endangered animals such as whales and seals which might be caught in the path of the oil, on the fragile ecology of our sensitive coastal waters, and on the magnificant recreational resources of Cape Cod and Nantucket. This sense of outrage is heightened by our relative helplessness and frustration both in trying to control and contain the damage from this particular oil spill and in the longer term, our seeming inability to bring the international transportation of oil by tanker under more effective regulatory safeguards.

Whatever the tragic losses which may arise from the wreck of the *Argo Merchant*, if we can learn from the experience and develop more effective measures for the future, the disaster will not be without its benefits, although purchased at tragic cost. I personally hope our concern over the immediate problem will not distract us from a broader look at what can and should be done in the future.

It is important to note that the U.S. has actively participated in and, indeed, played a leading role in trying to develop better international approaches to the problem of pollution of the seas by ships.

The U.S. enacted its own ocean dumping control legislation in 1972 and pressed for comparable international action. I led the U.S. delegation to the London conference in 1972 which finally adopted a global convention for the regulation of ocean dumping. This convention has been ratified by the U.S. and is in force.

Likewise, in 1973 I cochaired with the Commandant of the Coast Guard the U.S. delegation to the London conference which adopted the comprehensive International Convention on the Prevention of Pollution from Ships. That convention establishes construction and design standards for future tankers and deals with the problem of the intentional discharge of oil and oily wastes at sea. The convention was by no means as stringent in its standards as the U.S. had sought. For example, our proposal that double bottoms be required found little or no support among the other nations. In any event, this particular convention has not been ratified by the U.S. and, indeed, remains largely unratified by any of the signatory parties. While this represents some speculation on my part, I suspect that failure of ratification has been motivated in part, at least, by the desire to wait and see the outcome of the Law of the Sea negotiations. (At the same time, I am compelled to note that the parties which signed the convention at London have pointed to the regulatory standards and requirements contained in the convention as an argument against coastal state regulatory requirements in the Law of the Sea negotiations, while at the same time continuing to fail to ratify the very convention whose terms supposedly supported this argument.) Thus, one is forced to conclude that we are in danger of obtaining no effective international regulation in this area either through the Law of the Sea or through the 1973 convention.

In 1969 an international convention on liability for oil pollution damage was adopted which would allow recovery of damages from the shipowner of approximately $160 per gross registered tons up to a maximum of some $16.8 million, from the owner or operator of a vessel. The convention is in effect and has been ratified by Liberia, but not by the United States. Accordingly, we cannot invoke its provisions. However, it is fair to point out that since damage resulting from the wreck of the *Argo Merchant* will apparently occur outside U.S. waters, it would not be compensable under this convention.

I should point out that President Ford submitted extensive enabling legislation in the last Congress which would have permitted ratification of these last two conventions. The legislation was not acted upon. The same legislation proposed by the President also contained a proposal for a $200 million U.S. fund to compensate for damages from oil spills, made up of charges against importers.

This legislation was entitled the Comprehensive Oil Pollution Liability and Compensation Act.

The present Federal Water Pollution Control Act and other statutory authorities only extend to the waters over which the U.S. has jurisdiction. It has been suggested by some that the U.S. unilaterally establish a 200-mile pollution zone off our shores. Since the Law of the Sea negotiations have been designed to develop internationally applicable rules and to avoid a diversity of conflicting unilateral actions around the world with all the attendant potential adverse impacts on freedom of navigation, the U.S. has consistently opposed the establishment of such pollution zones by other Nations and refused to take such an action at home. Realizing that marine pollution does not respect political boundaries, the Environmental Protection Agency has been supportive of this overall U.S. position. However, it seems to me that, given the increasing uncertainties of the outcome of the Law of the Sea negotiations, we might do well now to reconsider our unilateral options.

Aside from the question of unilateral action to establish a pollution zone, the U.S. has clear authority to set a wide variety of regulatory requirements with respect to vessels entering U.S. ports. We have generally been reluctant to set such special rules, particularly those involving design specifications, again because of concern over similar and possibly differing actions by other countries. However, here again, it seems to me that the time may well have arrived when the U.S. should reassess this position and assert by statute and regulation a more aggressive approach to setting standards designed to protect our own shores and our own workers. All tankers, whether new or existing, which use U.S. ports should be held to strict standards of design, construction, operation, maintenance, surveillance, and boarding.

I have suggested informally over the last several days that we explore the feasibility of establishing technological surveillance of vessels approaching our shores. A wide area of sophisticated technologies are available today, including satellites. I recognize that a ship such as the *Argo Merchant* was in international waters and, thus, outside the U.S. regulatory jurisdiction. Nevertheless, it would seem to me entirely appropriate and not to give rise to any jurisdictional issues were we to plot the course of such an incoming ship, particularly in sensitive waters such as those involved in this case, and take appropriate measures to notify the vessel of its danger and of its proper course.

Let me make abundantly clear that, while most of the matters I have been addressing are of deep and continuing concern to me and to the Environmental Protection Agency, most of them fall within the particular field of expertise and statutory responsibility of the Coast Guard. I have not had an opportunity, in the brief period of notice before this hearing, to explore any of these proposals with the Coast Guard nor have I had any opportunity to seek an administration position. Thus, the suggestions must be taken as largely personal. They are put forward primarily to suggest directions for preventive action.

In this connection, it is apparent that we are dealing here with a plethora of international conventions, many of which remain unratified, domestic legislation, and ongoing negotiations of uncertain outcome. A number of Federal agencies are involved and, of course, there is a vital interest in all of these matters on the part of our coastal states. It seems to me that there is a crying need at this juncture for a comprehensive and coordinated look at all of these matters with a view to the prompt development of a comprehensive national strategy for dealing with the transportation of oil by ship. With this in mind, it is my expectation to recommend to the President the establishment of a Commission, chaired jointly by the Coast Guard and the Environmental Protection Agency, including other concerned Federal agencies and representatives of the States, to undertake this task on a priority basis. Obviously, any such a governmental group should provide an effective mechanism for consultation with the affected industries, labor, scientific community, and the public generally.

Senator KENNEDY. Our next witness is Robert White, who is the administrator for NOAA.

We will ask the remaining witnesses to file their statements, and they will be made a part of the record, and summarize their testimony.

Mr. White.

STATEMENT OF DR. ROBERT M. WHITE, ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ACCOMPANIED BY WILLIAM GORDON, REGIONAL DIRECTOR, NATIONAL MARINE FISHERIES SERVICE

Dr. WHITE. Mr. Chairman, before I start, I want to introduce Mr. William Gordon who is the regional director for the National Marine Fisheries Service, which is part of the National Oceanic and Atmospheric Administration. Let me say how much we appreciate the opportunity to come here to express our very special concern about this oil spill dealing with our fisheries on Georges Bank. NOAA is responsible for the health and management of our fisheries.

The hour is late, and so I will really make two very brief points. I have a prepared statement I would like to submit for the record.

I think that there are two questions that have been raised here tonight, the answers to which we can contribute in a substantive way.

First, what is happening to the spill, and where do we expect it to go?

Second, what will be the effect of this spill on the fisheries?

In answer to the first question, we have been providing weather and sea state forecasts to the strike force on a continuous basis out of our Boston offices.

As you know, the sea state has been rough, and the winds have been strong. This has had two effects. One, of course, is the breakup of the vessel. The other has been a favorable effect, and that is that is that the winds direction has been such as to take the oil spill away from our shores.

What is the outlook for the next few days?

I am pleased to be able to report that, at least on the basis of what we know now, it looks like the winds will continue out of the west. We expect a frontal passage perhaps tomorrow, with the winds going to the northwest, and increasing. So the sea state should remain rough, and the winds will continue to carry the oil further off our shore.

Senator KENNEDY. Goes northwest tomorrow?

Dr. WHITE. The front will pass tomorrow, and hence the winds will shift into the northwest.

We have had a group of scientists working on the grounding. They have been working with the Bureau of Land Management in connection with our environmental assessment off Alaska.

BUREAU OF LAND MANAGEMENT GROUP ASSESSING EFFECTS OF OIL SPILL NOW

This is a quick response team whose job is to determine the effects of oil spills. This is an excellent opportunity, however disastrous it might be, to document and learn about the effect of a major oil spill.

Our people have been working with the Coast Guard and other groups, and as Russell Train has pointed out, the team is in the field now trying to obtain this information.

The fisheries, however, are our deepest concern. We are concerned not only about the fisheries, but we are also concerned about what is happening to their habitats. I think the point now is that we really

do not know at the present time what the impact of this spill will be is upon the fisheries. This is something that we must learn about quickly.

If the oil remains near the surface, we estimate that the damage to the fisheries on Georges Bank will be minimal. If the materials sink to the bottom and there is some preliminary evidence that some of it may be sinking, this could be a very serious problem because of the important ground fisheries of Georges Bank.

So it becomes very vital that we exert all of our efforts to find out just what is happening to the oil, the extent to which it is covering the bottom, and the extent to which it is mixing with the sediments. If we do find that it is widely distributed along the bottom, I think we may have a serious problem, and not just a short run problem, but possibly a long run serious problem also.

That brings me to my major recommendation to this subcommittee. People strongly react to disasters such as this one. In the immediate aftermath, everybody gets very excited. A week, 2 weeks, three weeks after the disaster, interest is lost. This is a disaster that may very well have impact over long periods of time, and we just cannot drop our interest. It is going to be very important for us to maintain a long-term monitoring program to try to determine what the long-term effects of this oil spill may be on our fisheries resources.

Congresswoman Heckler has indicated she has been in contact with Assistant Secretary Coleman of the Department of the Interior. I have also been in contact with him, and I can verify that he has indicated, that insofar as that agency is concerned, they are quite prepared to help fund as we are, and as the Environmental Protection Agency is, a program of monitoring and assessment of what this means to our fisheries.

If you have specific questions with regard to the state of the industry today, Mr. William Gordon has been working with the industry, and is in a position to answer those questions.

Senator KENNEDY. You are satisfied, based upon the knowledge which you have at the present time, that it is going to have a serious adverse effect on the fisheries?

PERMANENT EFFECT OF SPILL ON FISHERIES UNCERTAIN AT PRESENT TIME

Dr. WHITE. We are not sure of that at the present time.

Senator KENNEDY. Well, how sure are you? What is your present assessment of the danger?

Dr. WHITE. The information is coming in almost each hour. We know something about what is happening to the oil. For example, we know it is now 200 miles from the point where it was originally put into the ocean.

There is some evidence, but it really has to be checked before I would want to make a statement, that some of the material is going down. But it is moving out fast.

Senator KENNEDY. What is activated if it goes down?

Dr. WHITE. If the oil sinks, and covers the bottom, it could cover it in one of several ways.

First, it could get mixed up with the sediments so it is very widely divided and then spread over a wide area of the bottom. The impact

of that would be that smaller animals would ingest this material and then the material would enter the food chain. It would be of serious concern over a long period of time.

If it went down in very large masses so they could be tracked and if you know where they were, then those areas could be avoided by the fisherman thereby minimizing their problems. It is really too early to tell.

Senator KENNEDY. When do you expect to know?

Dr. WHITE. Our people are in the field now. In the course of the next several weeks we should have pretty good information as to what is happening.

Senator KENNEDY. You are ready to support the Governor's recommendation as you develop information that would indicate that this is a serious or significant problem for the fisheries?

Dr. WHITE. I will be very glad to back it up, if that is what our information demonstrates, sir.

Senator KENNEDY. What about the ground fisheries?

You know, we have seen pictures of some of the ships that have come in with scallops that are covered with oil.

Dr. WHITE. Let me ask Mr. Gordon perhaps to answer that.

Mr. GORDON. Mr. Chairman, so far the evidence that we have obtained from our staff in the field, who have consulted with fishermen in the various ports along Cape Cod and Southern Massachusetts has not documented any landings of materials that are impregnated or contaminated to any degree with any oil. We understand that a few fishermen that have been along the periphery of the oil spill have had their gear fouled.

Senator KENNEDY. How many people have you got out there?

Mr. GORDON. We have about 40 people in the field.

Senator KENNEDY. In the field?

Mr. GORDON. Yes.

Senator KENNEDY. Where are they placed?

Mr. GORDON. From Point Judith to Provincetown.

Senator KENNEDY. I mean that are working on the problem.

Mr. GORDON. They are consulting with the fishermen almost on a daily basis as to what is occurring on the fishing grounds, and interviewing fisherman to find out where the fish are, what their catches were, and what the oil aspect is.

Senator KENNEDY. You are prepared to give both to them and to us, I am sure, the cooperation so that we can get whatever help and assistance is necessary.

Mr. GORDON. That is correct, sir.

Senator KENNEDY. Can you give us a judgment on this?

Mr. GORDON. As Dr. White has pointed out, if the material does settle to the bottom, it will obviously cause some damage to the bottom dwelling organisms.

Senator KENNEDY. But you cannot give us anything definite?

Mr. GORDON. That is correct, sir.

Senator KENNEDY. Senator Pell?

Senator PELL. If the worst happens, how long will that damage our fishing grounds?

Dr. WHITE. It could damage it for a good period of time.

Senator PELL. How many years?

Dr. WHITE. I asked that of my scientists, and they refused to give me a year, but it would be pretty extended.

Senator PELL. More than five?

Dr. WHITE. I do not think so.

Senator PELL. Thank you.

Senator KENNEDY. Congresswoman?

Mrs. HECKLER. No questions.

Senator KENNEDY. OK. Thank you very much.

Dr. WHITE. Thank you.

[The prepared statement of Dr. White follows:]

PREPARED STATEMENT OF DR. ROBERT M. WHITE

Mr. Chairman, I appreciate the opportunity to appear before this subcommittee tonight to outline the involvement of NOAA operational elements in assisting sister agency efforts to cope with the oil spill off Nantucket and in assessing the potential ecological effects. You can be assured that the National Oceanic and Atmospheric Administration is deeply concerned with the grounding of the *Argo Merchant* and the potential consequences this disastrous event may have upon the valuable fisheries resources of our country from the Georges Bank area and upon the local marine and coastal environments of Southern New England.

Our agency has been working closely with the Coast Guard and the Bureau of Land Management and also with local institutions since shortly after the accident occurred. We have been deeply involved in three efforts, namely, by providing environmental information in support of the Coast Guard operations, by deploying a scientific research oil response team, and by examining the impacts upon fisheries.

In support of the Coast Guard strike team, we are providing special weather and sea state forecasts through our National Weather Service office located in Boston. This support is in accordance with the national oil and hazardous substances pollution contingency plan. Our Boston office has been providing, and will continue to provide, the Coast Guard and other agencies with forecasts of winds, sea state, visibility and weather in the area for as long as necessary.

Our scientists also have been working closely with the Coast Guard in the measurement of oil movement. As part of a BLM/NOAA sponsored study for developing an oil trajectory predictive model for our OCS oil and gas environmental assessment studies off Alaska, we have formed an oil response team of scientists from several elements of NOAA and the Coast Guard for studying oil spills in order to acquire environmental information for use in our model development. This team was mobilized and responded immediately upon learning of the event last week. They have been working closely with the Coast Guard in measuring and delineating the oil movement and in coordinating the related research activities of other groups. The surface current and oil velocity measurements obtained by our team are being provided to the Coast Guard for use in their trajectory predictive model to assist the strike team. The NOAA team also is working with the Coast Guard in mapping the distribution of the oil. I am extremely proud of the manner in which Coast Guard and NOAA personnel are working together on such short notice and under the difficult sea and weather conditions that have been encountered in the area.

With our responsibilities for the fishery resources off our coasts, including their habitats, we are greatly concerned over the potential impact of this disaster upon these valuable resources—not only for the sake of the resources themselves, but also for the people who depend upon them for a livelihood or for consumption. For this reason, we have taken steps to divert one of our fishery research vessels, the *Delaware II*, to carry out a survey of the area upon which we can assess longer term effects. How serious this disastrous event will be upon the fish stocks in this area, we do not know at this time. However, it could be a very serious matter and we intend to find out. If the oil does not sink, but remains on the surface, we do not foresee as great a potential problem with the fish stocks, but such conditions could and has resulted in the contamination of fishing gear as the fish are landed aboard vessels operating in the area of the dispersed oil. On the other hand, if the oil sinks and remains on the seafloor,

it poses a more potentially serious problem. The extent of such cover and its relationship to stocks must be assessed. Many of the stocks off our New England coast already have been seriously stressed by man's activities through overfishing. Consequently, we must determine the impact of this additional and massive event upon these valuable resources.

I have directed our agency to assess the results of our initial efforts as soon as possible and to recommend to me such steps as must be taken for carrying out programs of long term monitoring as may be required. It is my intention that our diverse scientific capabilities will address this problem to the extent required, and we also will look to other agencies and institutions to work with us in the task likely to be confronting us. I already have been in contact with Mr. Ronald G. Coleman, the Assistant Secretary of Interior for Program Development and Budget. The Department of Interior, which has responsibilities for OCS activities, has assured me on behalf of Secretary Kleppe that the Department of Interior is prepared to join with NOAA and EPA in both the funding and execution of a program of monitoring so that we can fully understand the long-term effects of this event.

I believe that Congress in assigning our agency responsibilities under the Marine Protection Research and Sanctuaries Act fully intended us to so respond to disastrous events such as the grounding of the *Argo Merchant*, and we shall respond.

Senator KENNEDY. Jay Lanzillo, who is the President of the Cape Cod Commercial Fisherman's Coalition; John Burt, secretary-treasurer, New Bedford Fishermen's Union; Paul Brayton, who is executive-secretary, Atlantic Offshore Fish and Lobster Association; Richard Allen, Atlantic Offshore Fish and Lobster Association; and Hugh O'Rourke, Massachusetts Seafood Council and Boston Fisheries Association. Would you be kind enough to come forward?

I see an old friend, Hugh O'Rourke, back there. Hugh, you are always welcome at any congressional committee. We always benefit from your testimony. If you want to join us, if there is anything that these gentlemen do not speak to, you can comment on. Which of you gentlemen would like to start?

PANEL OF FISHERMEN CONSISTING OF JAY LANZILLO, PRESIDENT, CAPE COD COMMERCIAL FISHERMEN'S COALITION; JOHN BURT, SECRETARY-TREASURER, NEW BEDFORD FISHERMEN'S UNION; PAUL BRAYTON, EXECUTIVE-SECRETARY, ATLANTIC OFFSHORE FISH AND LOBSTER ASSOCIATION; RICHARD ALLEN, ATLANTIC OFFSHORE FISH AND LOBSTER ASSOCIATION; AND HUGH O'ROURKE, MASSACHUSETTS SEAFOOD COUNCIL AND BOSTON FISHERMEN'S ASSOCIATION

Mr. BRAYTON. Mr. Chairman, I do not personally have any prepared statement. I think perhaps Jay does, and I think the rest of us here feel any particular questions that you may have, we look forward to.

Senator KENNEDY. Jay?

Mr. LANZILLO. We have before us the almost impossible task of assessing both the short and long term impact of the tragic oil spill to ever be faced by a food producing industry. The fertility of our half depleted stocks is now even more threatened. Any further duress surely flags the death of a vitally needed protein resource. And I was a little bit unprepared myself.

Senator KENNEDY. That is all right. Just tell us, tell it as it is. What do you really feel is the nature of the threat. What are your

colleagues telling you; and what does it mean for both your livelihood and that of your associates. What does it mean financially? Does it mean being able to produce the resource which this State depends on, our region depends on, the world depends on, just in your own words.

You are out there on the firing line. You men spend a good deal of your lives in these waters, harvest the seas, and know the nature of what is happening out there, in ways which no one who does not spend a good deal of time out there really understands.

So we would like to hear from you. Tell us the ways that we can help. We do not have any magic wands. But we want to find out ways that we can help.

Mr. LANZILLO. I believe it would be impossible for us to make any sort of judgment as to what the outcome of the spill is going to be, but I think we can all rest assured that there is going to be an incredible amount of damage, and to get right to the point, I think we should first urge a moratorium of foreign fisheries be called for. The stocks are in bad enough shape. With the oil spill, we do not know how much worse it is going to be, and to allow the foreigners in, it would seem to me to be ridiculous.

Senator KENNEDY. Your concern is that until we know, at least, if there is going to be damage, rather than a wait and see attitude and finding out in a few weeks or months that there has been really an extremely devastating impact on fish, that we ought to put a moratorium on now. And then if we find out that it is not going to be as significant or dangerous as we suspected, then we can go ahead and lift it.

You would rather have the protection now, and then see what the information provides in the future, rather than the other way around, do I understand you correctly?

Mr. LANZILLO. To some degree. I would like to see stock assessments based on a total volume mass, and what we have here is an inherent conflict, full volume, I do not believe that in the past stock assessments have been stressed that way.

Senator KENNEDY. You mean in terms of evaluation, is that right?

Mr. LANZILLO. Yes.

Senator KENNEDY. What about that, Mr. White? What is your reaction to that, their assessment of the nature of the resource, as Mr. Lanzillo has pointed out?

Dr. WHITE. Well, we have a pretty extensive stock assessment program going there. We are trying to look at it in terms of the entire ecosystem and the bio mass.

I would certainly think that if we do have a very serious disaster there, and this remains a possibility, that that would be time to take action to make sure that our fishermen have access to those fish, and there is something, too, there to say, but I think it is just too early to tell.

IMPACT OF DISASTER WILL BE MONUMENTAL ON FISHING INDUSTRY OF MASSACHUSETTS

Mr. BURT. John Burt, secretary-treasurer, New Bedford Fishermen's Union. Yesterday morning, in the Port of New Bedford there was some 70,000 pounds of scallops landed, and almost 300,000 pounds of fish. This morning there was 98,000 pounds of scallops, and

240,000 pounds of fish. In my union there are 1,200 men. In the allied industries such as the fishpackers, fishhandlers, and unloaders, there is another 3,000 people involved. The New Bedford fishing industry contributes about 27 to 30 percent of the State's economy. In the State of Massachusetts we had $62 million paid to the ex-vessel price for the boats. New Bedford's contribution is $32 million.

If the fishermen's prayers are not answered, and this oil spill goes and it becomes a disaster, as it seems like it is going to become, we have to get some good Federal help some place.

Mr. ALLEN. My name is Richard Allen, I am a commercial lobster fisherman, fishing offshore out of Westport, Massachusetts. I think my general comment would be that we have to keep in mind that we do not want to come here and ask for Federal assistance. We do not relish being put in this position, and it is my feeling that we all, as consumers of the oil, that we all need and have to use, have to take the responsibility that if there is a disaster like this, we cannot allow the fishermen to bear the burden of it. After all the publicity and all the hubbub about it, the fishermen are still out there trying to make a living. If they are having difficulty, we have to do something to help them.

One of the potential problems that I see is that if either geographically or by species we find that vessels are displaced, they either cannot work in a certain area, or there is a reduction in a certain stock, so that folks cannot work on that stock, then we are going to get concentrations of vessels in that area around other stocks, and if we do not have a way to either provide the marketing for those products that are going to be brought in in increased supply, shift the effort onto other species, and onto new areas, we are going to have a real problem with concentration in limited areas.

I think some of the ongoing programs that we have in the New England area for developing some of our underutilized species, may have to be increased, to try to provide this opportunity. While we may lose some stocks, there may be others that are not affected that we could divert our boats to, and provide that opportunity. That should be given some close attention.

Senator KENNEDY. That is a very reasoned position, and I do not see how there could be any arguing with that. I think your point of assessing responsibility is an entirely fair and justifiable one I think this is really what we are attempting to pinpoint, those who have responsibility for this particular spill and to try through regulation or legislation or otherwise to ensure that the fishermen and those the supporting industry would not assume the burden. I think that that is really the crux of the issue. I think this is really what we are attempting to deal with.

Mrs. HECKLER. Will you yield?

Senator KENNEDY. Yes.

Mrs. HECKLER. I would like to say that since Westwood is in my district, I have a long but very courageous stream of fishermen from Westport of whom I am very proud, that we are concerned, and I feel that your testimony is important here today. If the national disaster is declared by the President, then that seems to be the only area of recourse at the present time. This will set into motion a number of

varieties of types of assistance, as Governor Dukakis said, not very inspiring talk, to suggest that we make assistance available to you, and that is an inadequate response.

REQUEST TO PRESIDENT TO DECLARE THE AREA A NATIONAL DISASTER

But since at this time, as Dr. White said, we cannot measure the impact, we do stand at a loss and I certainly support and have sent a message to the White House to urge the President to declare the national disaster which will set into motion a number of grants and SBA loans and assistance programs that can be of help to local fishermen in our area and New Bedford, et cetera.

But I am concerned, as I say, that the assistance available might be inadequate as it has never before been applied to a disaster of this kind, and might not really meet the needs of the fishermen since these disaster loans generally are channeled to businesses. It is a business loss but it is also a human loss, it is a professional loss, and there are many kinds of losses here that have not been assessed.

So I think it is very important for you to continue to make us aware of—both the adequacy and inadequacy of the governmental response because we really, by our presence and by our statements, feel great concern about this problem, about the fishermen. However, we will not be able to measure or evaluate even the disaster assistance programs without your input. So it is very important that we continue to have a dialogue on this subject should the declaration of disaster be expressed by the President.

Hopefully, some of our worst fears will not materialize, and I think that we are all going to say a prayer that that will be the case. But should the long-term and short-term impact be very serious, we will have to write perhaps a new law to cope with your particular problems because this has not been a national problem before. So I want to make it clear that my door is open, and I am sure the other members of the panel feel very strongly about preserving an interest in your well-being and your future not only because we care about you, but because we care about your role in the society and consider it very, very keenly. So that I wish to issue this invitation on an ongoing basis. I am a Heckler, but I invite you to heckle me.

I simply want to be effective on your behalf.

Senator KENNEDY. Hugh, do you want to say a few words and then the Mayor.

I want any members of the panel to be included.

Mr. O'ROURKE. My particular approach on this, Mr. Chairman, is related primarily to today.

Now, what I mean by today, actually I represent two organizations. One is the Massachusetts Seafood Council, and the other is the Boston Fisheries Association.

The Massachusetts Seafood Council is interested in providing information to the consumer about our delectable fish. One of the problems we are facing right now with the press is that their approach on this thing relates to Georges Bank. The part that is under consideration, obviously because of the accident, is only a singular part of the Bank. There are many other areas in which we fish.

Another item of interest, I do believe——

Senator KENNEDY. You are urging us to keep eating fish, Hugh?

Mr. O'ROURKE. Pardon?

Senator KENNEDY. To keep eating fish.

Mr. O'ROURKE. Exactly. We faced this before in 1972, and this was in red tide.

Senator KENNEDY. Look out for the swine flu shot but keep eating loss but it is also a human loss, it is a professional loss, and there are fish. [Laughter.]

Mr. O'ROURKE. This is about the size of it and, hopefully, and I think it is important to note that traditionally the fishing fleets stay home during the Christmas holidays, and the fish that you find in the marketplace today is an excellent product or it wouldn't be there. So I would like to convey to the listening audience or the TV audience, et cetera, that they need not worry about the fish in the marketplace. Every effort will be made by the fisheries to continue that good quality.

Senator PELL. One of the thoughts there, even if the fish has ingested oil, is that it is not poisonous, it is just bad tasting.

Mr. O'ROURKE. I cannot answer that because I do not think has to be taken care of by somebody who has the measurements of such a situation.

Senator KENNEDY. Are there any other comments on the panel?

Mr. BRAYTON. I would just like to say that it is our hope that the National Marine Fisheries Service will bend their backs to provide some vehicles for us, particularly with such small things as gear damage.

HOPE FOR COMPENSATION FOR RUINED NETS AND OTHER EQUIPMENT

For example, the fisherman who gets, unfortunately, involved with oil on the bottom and has a net ostensibly ruined by oil contamination, I think is possibly within the area of the National Marine Fisheries Service to try to develop a system to clean nets for us. Obviously we are dealing with synthetic products, and we just cannot put them in industrial solvent. It will dissolve the twine itself. But there are heat emulsifiers and things like that that could be set up for an immediate type of cure for this problem. It costs the fishermen between $1,000 and $1,500 for a net, and we cannot use them as disposable items.

Senator KENNEDY. What about it, Mr. Gordon, in NOAA?

Mr. GORDON. Senator, it is certainly feasible, and we have some people who could look at this situation.

Senator KENNEDY. Could you get authority to do it if it is declared a disaster?

Dr. WHITE. Yes, we could look at things like that.

Senator KENNEDY. Well, I will tell you what. Let us look at it maybe in Senator Brooke's office or my office. We will work with you. We will have a staff person who will work with you on this. We will try to work out the arrangements to make sure that others would participate. I am sure that NOAA will cooperate and we will work with you. I think it is a good suggestion for the type of things that could be done. OK.

I want all of you to understand that this is going to be a continuing process, that we are not just here today and gone tomorrow. We want to have a continuing relationship, both with the agencies and with you and your small group and the hundreds of others like you. We want to work with them and we will. We will continue to work with Senator Brooke and Congressman Studds and Congresswoman Heckler and Senator Pell and others, so that we will get our own little group that has worked with you to be of all the help we can. OK. Thank you very much.

Mr. LANZILLO. Excuse me. Are we over here?

Senator KENNEDY. Well——

Mr. LANZILLO. I had a whole lot of things I wanted to say.

Senator KENNEDY. I am sorry.

Mr. LANZILLO. I brought a chart here which basically outlines where the *Argo Merchant* went down. Unfortunately for the Chatham fleet, it happens to be one of the prime halibut long line grounds. To the north that happens to be one of the prime haddock and codfish grounds. I would like to relate, I heard earlier if we have ever seen tanker traffic moving through there, we have seen it, all the time.

Senator KENNEDY. In those areas that are shallow?

Mr. LANZILLO. Absolutely. There are many times we had to cut the gear to get out of the way of steamers.

Senator KENNEDY. These are outside the shipping lanes?

Mr. LANZILLO. Absolutely.

This is in 17-18 fathoms of water.

Senator KENNEDY. What? Is the Coast Guard aware of this?

Mr. LANZILLO. I am not sure.

Senator KENNEDY. Do you report it?

Mr. LANZILLO. No, it is not reported.

Senator KENNEDY. It is not really your responsibility, is it?

Mr. LANZILLO. We are just lucky we got out of the way.

Senator KENNEDY. Well, this is another concern, whether the Coast Guard has the manpower and the authority to do some of these things. We want to work with the Coast Guard. But I think this is a very significant point. Are there other ships similar to this out there banging around those waters. You know, there may be others out there tonight. How are we going to avoid that?

It seems to me that you cannot legislate against or prohibit human error; but you can make sure that ships will stay in those channels if they want to land in the ports of Massachusetts and the rest of the country.

You can establish those requirements, and you can survey that and make sure that they are doing it, it seems to me. You can make sure that their people are adequately trained and have adequate navigational equipment.

This is what I had heard, and I am interested that you comment on it, from your experience, that there are other tankers moving through a lot of shallow, dangerous waters.

Mr. LANZILLO. I would like to assure you, Senator, that if, in fact, you set up some kind of a program where we could call in to announce that there is a tanker outside the shipping lanes, I think fishermen would be glad to do it.

Senator KENNEDY. Yes, something like a hotline, something like that. Can the Coast Guard develop a kind of a hotline process on this?

Admiral STEWART. Senator, I really do not know what we could do about it if we did know they were there.

Senator KENNEDY. Well, I suppose that is the question we ought to find answers to. If you know that there is a significant traffic through those shallow areas. I do not think that you would have any problem in getting the kind of the support that would be necessary in the Congress for surveillance. If they are not going to stay in those shipping lanes, then they do not land at Boston. They just do not land here.

It seems to me that is the way we ought to do business. I do not see why there should be any hesitancy.

We are talking about giving some protection. We do it in the airlines. I happen to be a pilot. We have all kinds of rules and regulations.

If you do not fly for a certain number of hours, you go on out there to be brought up to speed on it. There are all kinds of regulations with regard to planes, all kinds of regulations about where you can fly, where you cannot fly.

You listen in when you come on back across the Atlantic and they will say tune in to Channel 4 which is way out, outside of American limits. You listen to the pilot, and they can spot you. Why should not we do this for ships off the coast of Massachusetts?

Admiral STEWART. I certainly would like to be able to keep them out of there.

Senator KENNEDY. All right. We want to get your support for these things which would make some sense.

Mrs. HECKLER. I would just like to say that the Coast Guard has had a very difficult role to play, and I happen to have been the author of an amendment which require them to monitor the lobster vessels because the gear was being destroyed by foreign vessels coming in. The Coast Guard was given the responsibility to do the monitoring.

I have to say really that the committees of the Congress were less than generous with the funding for the Coast Guard operation. But they did not have the number of helicopters that the situation required, and a little of this does go back to our responsibility in terms of recognizing the kinds of resources that you have to devote to this.

Senator KENNEDY. Well, that is true. But I do not know of any statement they have made to the Congress requesting it. I would like to go on the floor of the Senate and say that they have requested it.

They are going to have to provide surveillance for the 200-mile limit. Otherwise this would be a phony piece of legislation. Some surveillance process must be developed otherwise we cannot survey what has happened 25 miles off Nantucket.

What good is the 200-mile limit?

We have to start showing that this is a matter of importance. I think that we are going to find that these other countries are going to comply with it. I do not know how many more disasters we have to have. Go ahead, sir. Is there any matter that you want to discuss?

Mr. LANZILLO. Well, I do not want to hog the——

Senator KENNEDY. No. But, if there are any additional comments that you wish to make.

Mr. LANZILLO. Yes, I would like to address the lease sale 42. We came out strongly against that. The data that they had and what was there, the ability to handle spills, which has been more than adequately demonstrated, they do not have.

I would like to see a moratorium put on the lease sales, and I am speaking now for the coalition on Cape Cod. We sit closer to it than anyone else does. So maybe we can come out stronger against it. I do not know.

We just do not think that the oil companies have their act together, and now we have been asked to put our act together in a 200-mile bill. We would ask them to have their act together before they come out there.

Senator KENNEDY. OK. Very fine. Well, I think that is an excellent comment, and we will follow up on these matters. OK.

Mayor Markey, I see you here. I will give you 2 or 3 minutes. We really have to end this by 10 o'clock. We have representatives from EDA and also SBA, people that can help respond to this. If you would like to make any comments, Mayor Markey, we are glad to have you, and we know how interested you are in the fishing fleet and how active you are in advancing the cause of those who go to sea. We will keep order if we can now. Everybody has been very patient. We are running out of time here. We would like to get to all the witnesses.

STATEMENT OF HON. JOHN A. MARKEY, MAYOR, CITY OF NEW BEDFORD, MASS.

Mr. MARKEY. Senator Pell and Congresswoman Heckler, as the mayor of the City of New Bedford, which has the largest scallop fleet in the world we are very concerned about our fishing fleet.

Tonight there has been a lot of talk about legislation, but we have an immediate problem that must be handled now. The disturbing thing I heard is that we might undergo an environmental impact statement, and that is frightening, when our concern should be to get that oil out of there and to provide aid to the fishermen in the event of a disaster to the species.

I think what we do have is a procedure and the pressures that the Congress can use to make this a disaster area.

I think we should get the triggers ready to fire. When they do fire, all of the mechanisms are there, that the agencies have the authority to do what is necessary in a disaster area.

This is really what we are talking about. I think when cooler heads prevail, we can sit down and talk about legislation and regulations.

Tonight we have an immediate problem: our fishermen, our fishing fleet are the largest industry in our city, and also the health of other people through food services and so forth. Tonight's task is that Washington has got to make the decision that it is a disaster if something happens. Then the means necessary to correct the situation can be put into action immediately.

Senator KENNEDY. Good. Well, you have said it all in a few minutes, and said it well. I appreciate it. We want to work closely with you, as

we do always on these matters. Thank you very much, and we will look forward to working closely with you.

Our final panel will be Mr. William Fitzhenry of the Economic Development Administration; Talbot Bulkley, who is the regional director, Small Business Administration. If they would be good enough to come up here, I would ask if we could also have the regional director of the Federal Disaster Assistance Administration, Paul Hartzell, come up.

Mr. Hartzell, he is here isn't he?

This is really the umbrella organization, the Disaster Assistance Administration. Of course, you can still get SBA assistance without being declared a disaster. But let me ask you, Mr. Hartzell, just very briefly now, the Governor has requested the President to declare the emergency and all of us have supported the request. What can you tell us is the next step?

PANEL CONSISTING OF WILLIAM FITZHENRY, ECONOMIC DEVELOPMENT REPRESENTATIVE, BOSTON FIELD OFFICE, ECONOMIC DEVELOPMENT ADMINISTRATION; TALBOT BULKLEY, REGIONAL DIRECTOR, SMALL BUSINESS ADMINISTRATION; PAUL HARTZELL, REGIONAL DIRECTOR, FEDERAL DISASTER ASSISTANCE ADMINISTRATION, AND JOHN EDEN, ASSISTANT SECRETARY OF COMMERCE FOR ECONOMIC DEVELOPMENT

Mr. HARTZELL. Can you hear me all right?

Senator KENNEDY. Yes.

Mr. HARTZELL. At this point we have two requests. One for a small business declaration, and another for an emergency. We are in a position that we cannot determine the extent of the impact at this particular time.

I plan to meet with the Governor tomorrow at 10 o'clock to go into this in more detail, and try to get a handle on exactly what the damages are.

Senator KENNEDY. If it is a disaster, how can you help these fishermen?

Mr. HARTZELL. Should the President declare this as a major disaster, this, of course, would trigger all of the benefits of Public Law 93–288, including all the low interest loans, temporary housing. I do not think these benefits would help them here——

Senator KENNEDY. But it would help them on loans, and it would help them on equipment?

Mr. HARTZELL. Yes, sir, if it was declared a major disaster. But the Governor has asked for an emergency, and this principally makes available to him the expertise of the Government: equipment, men, supplies, the expertise that he might not have in the State, to respond to this particular type of emergency.

Senator KENNEDY. How long will it take you to make a decision after the information is in?

Mr. HARTZELL. Well, if this is really a severe type of thing, and I would point to the Chelsea fire, for instance, and the Teton Dam, those were declared in less than 24 hours.

Senator KENNEDY. So you can work quickly. This is obviously a different situation.

Mr. BULKLEY. Senator, this will give clarity. Under the SBA's disaster program there is only one program which is applicable here, and it is economic injury, which makes working capital available to the fishermen, and also makes moneys available for debt servicing.

However, we have a problem which yet has to be resolved, and I could not get any clarification on this today, and that is what is the duration going to be.

Of course, once the impact is specifically delineated, we will get some idea on the duration.

The SBA is ready to set up offices wherever there is a necessity for an office, whether it is six States, or just Massachusetts. We can man those offices in an hour, and we can begin processing, we can utilize the media to get the information out as to whether it is available, and we are ready to go. The only thing holding us up now is a presidential disaster declaration——

Mr. EDEN. Senator, my name is John Eden, and I am Assistant Secretary of Commerce for Economic Development. I met with Secretary Richardson at noon today, and he knew of the great urgency of this situation, and asked me if I would accompany Bob White to your hearings, so I am very happy to be here and have a chance to make a couple of comments.

In EDA, our concern is the negative economic impact that the oil spill could have on the fishing industry, the tourist industry, et cetera.

TITLE IX LEGISLATION DOES NOT REQUIRE A FEDERAL DISASTER DECLARATION

Unlike some of the other legislation that has been referred to, our title IX legislation does not require a Federal disaster declaration. Title IX of the Public Works and Economic Development Act of 1965 as amended, title IX provides funds for Special Economic Development and Adjustment Assistance.

As you may recall, we provided a grant to the fishing industry of Massachusetts only a few months ago. It was a $6.4 million grant to the State to revitalize the fishing industry in the Gloucester area. It will be used to build some on-shore facilities; for example, freezer locker, wharves, et cetera, provide loan assistance to enable the fishermen to rehabilitate their fishing vessels, fund a marketing program, et cetera. So this legislation is available now, and we can take immediate action with it, based upon the finding that there is some negative economic impact caused by the oil spill.

Assistant Secretary White said earlier in his testimony, it is a little premature for us to tell the nature of the economic effect on the fishing industry at this very time. We are going to watch it (that is, the potential economic impact) very, very closely.

Senator KENNEDY. Could you OK loans for the nets that this gentleman was talking about?

Mr. EDEN. This legislation enables us to extend grants to the State, or to a unit of local government. It might be and economic development district, it might be a town, or whatever, and then that unit can

83-526 O - 77 - 5

lend the grant money at a very reasonable interest rate to individual fishermen. So my point is that we are closely watching the situation. We have the means now to act if the threatened economic impact materializes.

Senator KENNEDY. Are you part of the meeting tomorrow with the Governor?

Mr. EDEN. Our people are. Bill Fitzhenry, who is our Economic Development representative, will be at that meeting. Secretary Richardson asked me to convey his great concern over this problem, and for us at EDA to address it as quickly as we can.

Senator KENNEDY. That is encouraging, and I would think that in the meantime, you offer an important opportunity for help and assistance for a lot of these fishermen.

Mr. EDEN. This program has an annual budget of only $77 million, and for fiscal year 1977, about $15 million of that is already committed. But it still does provide us with the wherewithal to do something on a modest scale, but at least respond to the needs.

Senator KENNEDY. In order to make sure that we could get our share, that it does not go down to the sun belt, stick that $20 million aside. OK. That is encouraging and helpful, and I hope we can see some followup on it. On the SBA assistance then, you have to get the additional information, too?

Mr. BULKLEY. Yes, but there is a degree of flexibility which we can exercise. I think it would be very helpful. I do not anticipate any difficulties in this area.

Senator KENNEDY. OK. Well, this is a very constructive and positive attitude by the agencies, which we are glad to see. We want to be very, very helpful. We would like to work with you, members of our staff will stay in touch and work with you, and see what ways we can be helpful.

Senator PELL. Bear in mind that some of our fishermen in Rhode Island are also affected by this.

Mr. BULKLEY. They are all included, Senator.

Senator PELL. Mr. Fitzhenry, do you want to say anything?

Mr. FITZHENRY. No thank you, I think the Assistant Secretary has covered it.

Senator KENNEDY. OK.

Well, I want to thank you very much for these comments, and I think that as a result of this hearing, all of us hopefully have a more complete understanding of the range of existing programs which can be immediately available to those who are affected: the fishermen, because this disaster has threatened their whole livelihood and the resource. I think we have seen strong reassurances from governmental agencies to try and determine, at the earliest possible time, what the short-term and long-term danger is to those fishing resources off our shores, we have assurances that those agencies will work with the affected people, that there is going to be every effort made to work with the State agencies to see what additional information is necessary to qualify for Federal disaster assistance. That can be extremely important and useful in helping the fishermen, not only from Massachusetts, but all throughout the New England area. I think that the assurances of the President, that this is a matter of priority is ex-

tremely encouraging. I think all of us obviously have no magic wands to wave this evening.

EXTENT OF DAMAGE DEPENDENT ON THE WEATHER

To a great extent, the extent of the danger is in the hands of nature, and the northwest breeze. Some of us hope it is a little more northerly, and a little more easterly. If anyone can move it over there, to keep it away from the fishery areas in the Georges Bank, we will be extremely grateful. But finally, we cannot escape the very important responsibility that the agencies have in working with us. I hope they will. I want to thank the Coast Guard for their appearance here, for their response in working with us, not only here in the region but also at the national level, to see what can be done to get greater safety and security for those that are plying the coast. I think Mr. Train said it very well.

I think we want to explore if additional legislation is necessary. I for one do not believe that additional legislation is necessary. I think that it is adequate, but we will have to explore that. We will work with the Coast Guard, and if there is a need, then we will propose it.

We want to work with the Coast Guard in assuring adequate protections to make sure that they are going to be able to protect these resources.

So I think that this has been very useful and helpful. I want to also thank our witnesses, all of our witnesses, and thank our listening audience. I think I speak for all the panel, that we will continue to work on this problem. We will follow up, and stay after it. I think it is going to take a long and considerable effort on all of our parts, and we are prepared to see that effort continue. I want to thank all of you for testifying here this evening.

The subcommittee stands in adjournment.

[Whereupon, at 9:55 p.m., the subcommittee was adjourned.]

APPENDIX

95TH CONGRESS
1ST SESSION

S. 182

IN THE SENATE OF THE UNITED STATES

JANUARY 11 (legislative day, JANUARY 10), 1977

Mr. KENNEDY introduced the following bill; which was read twice and referred to the Committee on Commerce

A BILL

To amend the Ports and Waterways Safety Act of 1972 in order to establish comprehensive liability and compensation for damages from oil spills, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Federal Tanker Safety and Marine Anti-Pollution Act of 1977".

SEC. 2. Section 4417a of the Revised Code of the United States as amended by section 201 of the Ports and Waterways Safety Act of 1972 (46 U.S.C. 391a) is amended by striking paragraph (1) and inserting in lieu therefore the following:

"(1) STATEMENT OF POLICY.—(a) The Congress hereby finds and declares—

"That the carriage by vessels of certain cargoes in bulk creates substantial hazards to life, property, the navigable waters and the waters of the fishery conservation zone as established by the Fishery Conservation and Management Act of 1976 (including the quality thereof) and the resources contained therein and on the adjoining land, including but not limited to fish, shellfish, and wildlife, marine and coastal ecosystems and recreational and scenic values, which waters and resources are hereafter in this section referred to as the 'marine environment'.

"That existing standards for the design, construction, alteration, repair, maintenance, and operation of such vessels must be improved for the adequate protection of the marine environment.

"That it is necessary that there be established for all vessels carrying such cargoes and desiring to enter United States ports, the navigable waters of the United States or the fishery conservation zone comprehensive minimum standards of design, construction, alteration, repair, maintenance, and operation to prevent or mitigate the hazards to life, property, and the marine environment.

"That it is clear the costs of failing to impose such standards and requirements are sufficient to justify requiring these standards on a unilateral national basis while maintaining continuing efforts to achieve adequate and uniform international standards.

"That it is necessary to develop effective and efficient traffic control systems both in the approaches to United States ports and within such ports to prevent or mitigate the hazards to life, property and the marine environment.".

SEC. 3. (a) Section 201 (2) of the Ports and Waterways Safety Act of 1972 (46 U.S.C. 391a) is amended by inserting after "the navigable waters" the following: "or the fishery conservation zone".

(b) Such section is further amended by striking paragraph (3) and inserting in lieu thereof the following:

"(3) In order to secure effective provision for vessel safety, and for protection of the marine environment, the Secretary of the department in which the Coast Guard is operating (hereafter referred to in this section as the 'Secretary') shall for the vessels to which this section applies—

"(A) establish, operate, and maintain mandatory vessel traffic services and systems including mandatory ship lanes wherever potential hazards are present;

"(B) require all vessels to comply with such

services or systems, including the carrying or installation of electronic or other devices necessary for the use of the service or system;

"(C) establish an on-shore traffic monitoring system utilizing satellite, radar, or other appropriate technologies to insure the capability of warning ships which stray out of the mandatory ship lanes with sufficient time to permit them to correct their course prior to damage occurring to them, to other vessels or structures, or to the marine environment, and such a system shall begin to operate in the approaches to Boston, Puget Sound, and Houston within one year from the date of enactment of the Federal Tanker Safety and Marine Anti-Pollution Act of 1977 and be phased in at other major ports over the five-year period following such date of enactment;

"(D) control vessel traffic for major ports, harbors, and other waters subject to congested vessel traffic by—

"(i) specifying times of entry, movement, or departure to, from, within, or through ports, harbors, or other waters;

"(ii) establishing vessel traffic routing schemes;

"(iii) establishing vessel size and speed limitations and vessel operating conditions;

"(iv) restricting vessel operation, in a hazard-

ous area or under hazardous conditions, to vessels which have particular operating characteristics and capabilities which he considers necessary for safe operation under the circumstances;

"(v) direct the anchoring, mooring, or movement of a vessel when necessary to prevent damage to or by that vessel or her cargo, stores, supplies, or fuel; and

"(vi) requiring pilots on self-propelled vessels engaged in the foreign trades in areas and under circumstances where a pilot is not otherwise required by State law to be on board until a State having jurisdiction of an area involved establishes a requirement for a pilot in that area or under the circumstances involved;

"(E) require the most effective ship-board navigational equipment including but not limited to—

"(i) dual radar systems with both short-range and long-range capability;

"(ii) long-range navigational aids for accurate positioning including loran-A and loran-C combined with radio communications with on-shore traffic control centers;

"(iii) introduction of transponder equipment as soon as practical aboard each tanker which would

automatically report loran-C position and tanker identification information to on-shore traffic control centers;

"(iv) collision avoidance radar systems for all new tankers and all existing tankers over twenty thousands deadweight tons; and

"(v) gyro compass, fathometer, instruments, charts, plotting equipment, control and communication systems and other facilities;

"(F) require any vessel of more than twenty thousand deadweight tons, if the construction of such vessel is contracted for or actually commenced after June 30, 1977, to be equipped with a segregated ballast capacity which is determined to be appropriate by the Secretary, and such capacity shall be achieved in part by fitting, throughout the cargo length of each such vessel, a double bottom;

"(G) establish for vessels constructed or commenced to be constructed prior to June 30, 1977, similar requirements, where feasible from an engineering standpoint, to be applicable no later than five years from the date of enactment of the Federal Tankers Safety and Marine Anti-Pollution Act of 1977 except that the Secretary may waive the requirements for retrofitting of a

double bottom where he finds it necessary and not in conflict with the purposes of this legislation;

"(H) require inert gas systems for vessels under the same time provisions as in paragraphs (F) and (G);

"(I) require all tankers to be assessed as to the adequacy of propulsion and maneuvering systems especially in confined waters and under congested port conditions, and such assessment shall determine whether such tanker has sufficient control capabilities to safely enter and maneuver in prevailing conditions of each port it is cleared to enter, and if the capabilities are not sufficient, such vessel shall use tug assistance of suitable size at all times;

"(J) require all tankers entering United States ports to have annual inspections by an agent designated by the Secretary and have the condition of each tanker and any deficiencies recorded, and require that all deficiencies shall be corrected prior to entry into the area to which this section is applicable and all corrective work documented, with tanker structure, machinery, navigation equipment, pollution control equipment, electrical systems, control systems and other equipment certified as to condition and operability, with tankers over ten

years of age having a special inspection particularly on structural integrity, and the Secretary shall issue special reports on structural adequacy of tankers over ten years of age and consider whether to limit operations or loading conditions or to require structural modifications to each such tanker;

"(K) require all tankers to be manned by personnel licensed and trained in accordance with United States Coast Guard standards, or, where the Secretary determines that foreign training and licensing standards are equivalent to United States Coast Guard Standards, such foreign standards for foreign flag tankers, and such standards shall include, as a minimum, the following:

"(i) instruction in all aspects of ship handling, navigation, and emergency situations related to normal operations in coastal and confined waters and special operations under casualty conditions;

"(ii) formal training with modern equipment and ships or simulators for specific positions and ship types;

"(iii) regular training for upgrading positions or changing ship types and responsibility;

"(iv) licenses, conditions of licensing, and period of licensing determined by experience, train-

ing and retraining accomplished, and regular performance testing."

(c) Such section is further amended by striking paragraphs (5), (6), and (7) and by inserting in lieu thereof the following:

"(5) (A) ENFORCEMENT AND INSPECTION.—No vessel subject to the provisions of this section shall, after the effective date of the rules and regulations established hereunder, enter a United States port with such cargo, until a certificate of inspection has been issued to such vessel in accordance with the provisions of title 52 of the Revised Statutes of the United States and until a permit has been endorsed on such certificate of inspection by the Secretary, indicating that such vessel is in compliance with the provisions of this section and the rules and regulations established hereunder, and showing the kinds and grades of cargo that such vessel may have on board or transport. Such permit shall not be endorsed by the Secretary on such certificate of inspection until such vessel has been inspected by the Secretary and found to be in compliance with the provisions of this section and the rules and regulations established hereunder. The Secretary shall issue such certificates for a period not extending beyond one year.

"(B) The Secretary shall begin publication as soon as

practicable of proposed rules and regulations under this section as amended by the Federal Tanker Safety and Marine Anti-Pollution Act of 1977. Such rules and regulations shall take effect not later than September 30, 1977.

"(C) The Secretary shall cause proposed rules and regulations published by him pursuant to this section to be transmitted to appropriate international forums for consideration as international standards.

"(D) Rules and regulations previously promulgated remain in effect unless subsequently amended pursuant to the provisions of the Federal Tanker Safety and Marine Anti-Pollution Act of 1977.

"(E) Any rule or regulation promulgated pursuant to this section shall be equally applicable to foreign vessels and United States-flag vessels covered by this section. If a treaty, convention, or international agreement provides for reciprocity of recognition of certificates or other documents to be issued to vessels by countries party thereto, which evidence compliance with rules and regulations issued pursuant to such treaty, convention, or agreement, the Secretary, if he finds that such provisions are equivalent to rules and regulations issued pursuant to this section, in his discretion, may accept such certificates or documents as evidence of compliance with such rules and regulations.

"(F) The Secretary shall carry out such other inspections as he may deem necessary to insure compliance with the rules and regulations or to insure the purposes of this act. Violation of such rules or regulations or the presence of a condition threatening to life, property, or the marine environment shall be considered sufficient cause for such vessel to be denied entrance into U.S. navigable waters or U.S. ports until the Secretary determines the violation or threat has been removed.".

SEC. 5. The Ports and Waterways Safety Act of 1972 is further amended by adding at the end thereof the following new titles:

"TITLE IV—OIL SPILL PREVENTION AND CLEANUP

"SEC. 401. (a) The Secretary is directed to establish a coordinated program of experimentation with methods to reduce the risk of oil spill and to improve the technology for clearing up after oil spills. Such efforts shall include—

"(1) Experimenting to determine the most effective combustion agents for burning petroleum products and crude oil once a ship has grounded and a spill appears likely.

"(2) Experimenting with solidifying petroleum products and crude oil through use of congealing agents while oil is aboard ship.

"(3) Experimenting with combustion agents once oil has spilled into the marine environment.

"(4) Experimenting with various cleanup procedures both in enclosed marine environment and on the high seas.

"(b) Such funds as may be necessary are authorized for this purpose.

"(c) Such efforts shall be undertaken after consultation with the Administrator of the Environmental Protection Administration, the National Science Foundation, and the Administrator of the National Oceanic and Atmospheric Administration.

'TITLE V—FEDERAL OIL POLLUTION LIABILITY AND COMPENSATION

"SEC. 501. STATEMENT OF POLICY.—(a) The Congress hereby finds and declares that—

"(1) the damages and cleanup costs resulting from offshore oil spills are matters of major national concern;

"(2) the transportation, production, and handling of oil in, on, or near inland and ocean waters create environmental risks, and may impair the rights of shore-

line property owners and harm the general health and welfare of citizens of the United States;

"(3) existing law with respect to liability and compensation for oil pollution damage is inconsistent, inadequate, incomplete, inefficient, and inequitable; and

"(4) the legal rules applicable to oil pollution liability and compensation need to be rationalized and reformed to assure that adequate and timely compensation is available for oil pollution from all sources.

"(b) PURPOSES.—It is therefore declared to be the purpose of the Congress in this Act to—

"(1) enact a comprehensive national law governing offshore oil pollution liability and compensation;

"(2) maximize the incentive for all persons producing, transporting, or handling oil to take all steps necessary or appropriate to prevent the discharge of oil;

"(3) establish a strict liability standard for cleanup costs and damages resulting from the discharge of oil;

"(4) create a single and all-inclusive compensation fund to pay for all cleanup and damages resulting from such a discharge;

"(5) provide adequate funds and an expeditious procedure to compensate those injured by such a discharge; and

"(6) provide for the restoration, rehabilitation, or replacement of the natural resources damaged by a discharge of oil.

"DEFINITIONS

"SEC. 502. As used in this title, unless the context indicates otherwise, the term—

"(1) 'Administration' means the Federal Oil Pollution Liability and Compensation Administration;

"(2) 'Administrator' means the chief executive of the Administration;

"(3) 'aquatic and terrestrial environment' includes but is not limited to the navigable waters of the United States (including the lands therein and thereunder), the adjacent shorelines (including waters therein and thereunder), the waters of the contiguous zone, the waters within the safety zone around a deepwater port, and the waters superjacent to the Continental Shelf of the United States, the fish, wildlife, and other living resources of such lands and waters; and the recreational and scenic values of such lands, waters, and resources;

"(4) 'barrel' means forty-two United States gallons at 60 degrees Fahrenheit;

"(5) 'cleanup costs' means all actual costs, including, but not limited to, administrative and other

83-526 O - 77 - 6

costs to the Federal Government, to any State or local government, to any foreign governments, or to their contractors or subcontractors, of (A) removing or attempting to remove, or (B) taking other measures to prevent, reduce, or mitigate damages to the public health or welfare, or to public and private property including but not limited to shorelines, beaches, and the natural resources of the aquatic and terrestrial environment;

"(6) 'contiguous zone' means the entire zone established or to be established by the United States under article 24 of the Convention on the Territorial Sea and the Contiguous Zone (15 UST 1606; TIAS 5369) or otherwise by law or treaty, and includes the fishery conservation zone established pursuant to the Fishery Conservation and Management Act of 1976;

"(7) 'damages' means all direct and proximate damages, except cleanup costs, suffered by any person as a result of a discharge of oil, including—

"(A) the value of any loss or injury at the time such loss or injury is incurred, with respect to any real or personal property that is damaged or destroyed as a result of a discharge of oil;

"(B) the cost of restoring, repairing, or replacing any real or personal property that is damaged or

destroyed by a discharge of oil; any income necessarily lost during the time such property is being restored, repaired, or replaced; and any reduction in the value of such property thereafter, by comparison with its value prior to such discharge;

"(C) any loss of income or impairment of earning capacity due to damages to real or personal property, including natural resources, without regard to ownership of such property or resources, that is damaged or destroyed by a discharge of oil, if the claimant derives at least 50 per centum of his earnings from activities which utilize the property or natural resources;

"(D) any costs and expenses incurred by the Federal or any State government in the rehabilitation of natural resources that are damaged or destroyed by a discharge of oil;

"(E) any loss to citizens of any use of real property or of natural resources as a result of a discharge of oil, if such property or resources are owned, managed, held in trust, or otherwise controlled by the Federal or any State government; and

"(F) any loss of tax revenue by a State or local

government due to injury to real or personal property directly resulting from oil contamination.

"(8) 'deepwater port' has the meaning set forth in section 3(10) of the Deepwater Port Act of 1974 (33 U.S.C. 1502(10));

"(9) 'discharge' includes, but is not limited to, any spilling, leaking, pumping, pouring, emptying, or dumping, regardless of whether it occurred intentionally or unintentionally;

"(10) 'facility' includes, but is not limited to, any oil refinery, drilling platform, oil storage or transfer terminal, pipeline, or any appurtenances related to any of the foregoing, that is used, or is capable of being used, to refine, drill for, pump, produce, store, handle, transfer, process, or transport oil; the term does not include a vessel or a deepwater port;

"(11) 'fund' means the Federal Oil Pollution Compensation Fund;

"(12) 'licensee' means a person who holds a valid license for the ownership, construction, and operation of a deepwater port;

"(13) 'natural resources' means land, fish, wildlife, biota, air, water, and other such resources owned, man-

aged, held in trust, or otherwise controlled by the Federal or any State government;

"(14) 'offshore facility' means any facility located in, on, or under the navigable waters of the United States or waters of the contiguous zone, or any facility utilized in oil exploration or production activities on the Outer Continental Shelf of the United States;

"(15) 'oil' means petroleum, including crude oil or any fraction or residue therefrom;

"(16) 'owner and operator' means (A) with respect to a vessel, any person owning, operating, or chartering by demise, such vessel; (B) with respect to an offshore facility, any person owning or operating such facility, whether by lease, contract, or other form of agreement; and (C) with respect to any abandoned facility, the person who owned or operated such facility immediately prior to such abandonment;

"(17) 'person' means an individual, a public or private corporation, partnership or other association, or a government entity;

"(18) 'person in charge' means the individual immediately responsible for the operations of a vessel, offshore facility, or deepwater port;

"(19) 'safety zone' means the safety zone around a deepwater port as defined pursuant to section 10(d)

of the Deepwater Port Act of 1974 (33 U.S.C. 1509 (d));

"(20) 'Secretary' means the Secretary of Transportation;

"(21) 'State' includes each of the States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Canal Zone;

"(22) 'transfer' or 'transferred' includes, but is not limited to, both onloading and offloading between a facility and a vessel, between vessels, between facilities; or between a vessel and a deepwater port; and

"(23) 'vessel' means every description of watercraft or other contrivance that is used, or capable of being used, as a means of transportation on water, whether self-propelled or not.

"PROHIBITION, NOTIFICATION, AND CLEANUP

"SEC. 503. (a) (1) The discharge of oil into the aquatic and terrestrial environment in harmful quantities as determined by the President under section 311 (b) (4) of the Federal Water Pollution Control Act is prohibited.

"(2) The owner or operator of a vessel, offshore facility, or licensee of a deepwater port, from which oil is discharged in violation of this section shall be assessed a civil penalty of not more than $10,000: *Provided, however,*

That such owner, operator, or licensee shall not also be assessed a civil penalty, under section 311 (b) (6) of the Federal Water Pollution Control Act or section 18 (a) (2) of this Act, for the same discharge.

"(b) Any person in charge of a vessel, offshore facility, or deepwater port shall, as soon as he has knowledge of any discharge of oil from such vessel, facility, or port in violation of this section, immediately notify the appropriate agency of the United States Government of such discharge. Any such person who fails to notify immediately such agency of such discharge shall, upon conviction, be fined not more than $10,000, or imprisoned for not more than 1 year, or both: *Provided, however,* That no person convicted under this section shall also be convicted for the same failure to notify under section 311 (b) (5) of the Federal Water Pollution Control Act or under section 18 (b) of this Act. Notification received pursuant to this section or information obtained by the exploitation of such notification shall not be used against any such person in any criminal case, except a prosecution for perjury or for giving a false statement.

"(c) (1) Whenever any oil is discharged, the President shall act to remove or arrange for the removal of such oil, unless he determines such removal will be done properly and expeditiously by the owner or operator of the vessel,

offshore facility, or deepwater port, from which the discharge occurs.

"(2) Removal of oil and actions to minimize damage from oil discharged shall, to the greatest extent possible, be in accordance with the National Contingency Plan for removal of oil and hazardous substances established pursuant to section 311.(c) (2) of the Federal Water Pollution Control Act.

"(3) Whenever the President acts to remove a discharge of oil pursuant to this subsection, he is authorized to draw upon the money available in the Fund established pursuant to this title. Such money shall be used to pay promptly for all cleanup costs incurred by the President in removing or in minimizing damage caused by such oil discharge.

"LIABILITY FOR DISCHARGE OF OIL

"SEC. 504. (a) All cleanup costs, incurred by the President, Secretary or any other Federal, State, or local official or agency, or any other person, in connection with a discharge of oil in violation of this title shall be borne by the owner and operator or licensee of the vessel, facility or deepwater port from which the discharge occurred.

"(b) (1) Notwithstanding any other provision of law and except as provided in subsection (d), the owner and operator of a vessel shall be jointly and severally liable,

without regard to fault, for damages which result from a discharge of oil in violation of this title from such vessel. Such liability shall not exceed $150 per gross ton, or $50,000,000, whichever is greater, except that if it can be shown—

"(A) that such discharge was the result of gross negligence or willful misconduct, within the knowledge and privity of the owner, operator, or person in charge; or

"(B) that such discharge was the result of a violation of applicable safety, construction, or operating standards or regulations; such owner and operator shall be jointly and severally liable for the full amount of cleanup costs and damages.

"(2) The owner and operator of a vessel carrying oil which has been transported through the trans-Alaska pipeline and loaded on such vessel at the terminal facilities of the pipeline, shall be jointly and severally liable, without regard to fault, subject to the limits and conditions contained in this subsection, to residents or the Government of Canada for cleanup costs and damages resulting from the discharge of oil from such vessel.

"(c) Notwithstanding any other provision of law and except as provided in subsection (d):

"(1) The owner and operator of an offshore facility

shall be held jointly and severally liable without regard to fault, for damages which result from a discharge of oil in violation of this title from such facility. Such liability shall not exceed $50,000,000, except that if it can be shown that (A) such damages were the result of gross negligence of willful misconduct within the privity and knowledge of such owner or operator, or the person in charge of such facility; or (B) that such discharge was the result of a violation of applicable safety, construction, or operating standards or regulations; such owner and operator shall be jointly and severally liable for the full amount of such damages.

"(2) The licensee of a deepwater port shall be liable without regard to fault for damages which result from a discharge of oil in violation of this title from such deepwater port. Such liability shall not exceed $150,000,000, except that if it can be shown that such damages were the result of gross negligence or willful misconduct within the privity and knowledge of the licensee or any person in charge of such port, or that such discharge was the result of a violation of applicable safety, construction or operating standards or regulations, such licensee shall be liable for the full amount of such damages.

"(d) Liability for costs and damages resulting from a

discharge of oil shall not be imposed on any person pursuant to subsection (a), (b), or (c), if the owner, operator, or licensee involved establishes that such discharge was caused solely by an act of war. In addition, liability with respect to damages claimed by a damaged party shall not be imposed under subsections (b) and (c) of this section if the owner, operator, or licensee involved establishes that such discharge was caused solely by the negligence or international act of such damaged party.

"(e) (1) In any case in which the owner and operator of a vessel are held liable, pursuant to subsection (a) or (b), for costs and damages resulting from a discharge of oil, such an owner or operator shall be subrogated, if such discharge was caused by negligence on the part of the owner or operator of an offshore facility or on the part of the licensee of a deepwater port, to the rights of any person who is entitled to recover any damages against such owner, operator, or licensee.

"(2) In any case in which the owner and operator of an offshore facility are, or in which the licensee of a deepwater port, is held liable, pursuant to subsection (a) or (c), for cleanup costs and damages resulting from a discharge of oil, such an owner, operator, or licensee shall be subrogated, if such discharge was the result of the unseaworthiness of a vessel or the negligence of a vessel's owner or operator, to

the rights of any person who is entitled to recover any damages against the owner or operator of such vessel.

"(3) The provisions of this section shall not in any way affect or limit any rights that an owner or operator of a vessel, an offshore facility, or a licensee or that the Fund may have against any third party whose acts may have caused or contributed to a discharge of oil.

"(4) In any case in which the owner and operator of a vessel, or an offshore facility are, or in which the licensee of a deepwater port, is held liable, pursuant to subsection (a), (b), or (c), for costs and damages resulting from a discharge of oil that was caused solely by negligence on the part of the Federal Government in failing to maintain adequate aids to navigation, such owner, operator, or licensee shall be entitled to recover cleanup and damage expenditures from the Federal Government. In such cases, the Fund shall also be entitled to seek recovery from the Federal Government for cleanup and damage expenditures by the Fund.

"THE FEDERAL OIL POLLUTION LIABILITY AND COMPENSATION ADMINISTRATION

"SEC. 505. There is hereby established in the Department of Transportation an agency which shall be known as the Federal Oil Pollution Liability and Compensation Administration.

"(b) (1) There shall be at the head of the Adminis-

tration the Administrator of the Federal Oil Pollution Liability and Compensation Administration. The Administrator shall be appointed by the President, by and with the advice and consent of the Senate, and shall be compensated at the rate now or hereafter provided for level IV of the Executive Schedule pay rates (5 U.S.C. 5315). The Administrator shall report and be responsible to the Secretary, except that decisions of the Administrator shall not be subject to review, delay, reversal, or other action by the Secretary or any other officer or employee of the Department of Transportation.

"(2) There shall be in the Administration a Deputy Administrator of the Federal Oil Pollution Liability and Compensation Administration. The Deputy Administrator shall be appointed by the President, by and with the advice and consent of the Senate, and shall be compensated at the rate now or hereafter provided for level V of the Executive Schedule pay rates (5 U.S.C. 5316). The Deputy Administrator shall perform such functions as the Administrator shall from time to time assign or delegate, and shall act as Administrator during the absence or disability of the Administrator or in the event of a vacancy in the office of Administrator.

"(3) There shall be in the Administration a General Counsel who shall be appointed by the President, by and with the advice and consent of the Senate, and shall be

compensated at the rate now or hereafter provided for level V of the Executive Schedule pay rates (5 U.S.C. 5316).

"(c) FUNCTIONS.—The Administrator shall—

"(1) establish and maintain the Fund, in accordance with section 506;

"(2) act as trustee of the natural resources of the marine environment, in accordance with section 507;

"(3) require financial responsibility, in accordance with the provisions of section 508;

"(4) establish regulations and provide for the fair and expeditious settlement of claims, in accordance with section 509;

"(5) provide public access to information and conduct public education programs, in accordance with section 510;

"(6) submit an annual report, in accordance with section 511; and

"(7) perform such other functions as are prescribed by law or by the Secretary.

"(d) POWERS.—In the performance of his functions, the Administrator is authorized to—

"(1) appoint, fix the compensation, and assign the duties of such officers and other personnel as may be necessary or appropriate, and to delegate authority of the Administrator to any such personnel;

"(2) utilize, with the consent of the agency concerned, the services or personnel, on a reimbursable basis or otherwise, of any Federal Government agency, of any State or local government agency, or of any organization, to perform such functions on behalf of the Administrator as are necessary or appropriate;

"(3) make, promulgate, issue, rescind, and amend such rules and regulations as may be necessary to carry out the purposes of this title;

"(4) conduct such studies and investigations, obtain such date and information, and hold such meeting or public hearings as may be necessary or appropriate to facilitate the exercise of any authority granted to, or the performance of any function imposed on, the Administrator under this title;

"(5) enter into such contracts, agreements, and other arrangements as are deemed necessary or appropriate for the acquisition of material, information, or other assistance related to, or required by, the implementation of this title; and

"(6) issue and enforce orders during proceedings maintained pursuant to this title including, but not limited to, issuing subpenas, administering oaths, compelling the attendance and testimony of witnesses and the

production of books, papers, documents, and other evidence, and the taking of depositions.

"THE FEDERAL POLLUTION COMPENSATION FUND

"SEC. 506. (a) There is established within the Administration a Federal Oil Pollution Compensation Fund. The fund shall be a nonprofit corporate entity which may sue or be sued in its own name.

"(b) (1) Moneys in the fund shall be disbursed for the following purposes and no others:

"(A) administrative and personnel expenses of the fund, after appropriation in an appropriation Act;

"(B) cleanup costs resulting from the discharge of oil incurred (i) pursuant to section 502 of this Act, (ii) pursuant to section 311 of the Federal Water Pollution Control Act, (iii) pursuant to any State or local law, or (iv) by the owner or operator of a vessel offshore facility or a licensee of a deepwater port if it can be shown that such discharge was caused solely by an act of war or negligence on the part of the Federal Government in establishing and maintaining aids to navigation;

"(C) all damages not actually compensated pursuant to section 502 of this Act, and for damages whenever the source of the discharge cannot be determined or is beyond the jurisdiction of the United States; and

"(D) research into methods for preventing, containing, and removing discharges of oil.

"(2) Payment of compensation by the fund shall be subject to the fund acquiring by subrogation all rights of the claimant to recovery cleanup costs or damages from the discharger. The fund shall diligently pursue recovery for any such subrogated rights.

"(3) Notwithstanding the above, the fund shall not be liable to pay cleanup costs and damages of any claimant whose negligence or intentional act was the sole cause of the discharge.

"(c) In all claims or actions by the fund against any owner, operator, licensee, or other person providing financial responsibility, the fund shall recover (1) the amount the fund has paid to the claimant or to any governmental entity undertaking cleanup operations, without reduction, and (2) interest on that amount, at the existing commercial interest rate, from the date upon which the request for reimbursement was issued from the fund to the owner, operator, licensee, or other person, to the date upon which the fund is paid by such owner, operator, licensee, or other person.

"(d) (1) The fund shall be provisioned through the levy and collection by the Administrator of a 5-cent-per-barrel fee imposed on the owner of oil when the oil is transferred between (A) a vessel and an offshore facility, (B)

83-526 O - 77 - 7

offshore facilities, or (C) a vessel and a deepwater port. All moneys in the deepwater port liability fund shall be placed in the Fund. Any oil upon which a fee has once been levied pursuant to clause (A), (B), or (C) of this paragraph shall not be subject to a subsequent levy under this paragraph.

"(2) The collection of the fee shall continue until the fund reaches $250,000,000 whereupon collection shall be suspended. The collections shall be resumed when the Fund is reduced below $200,000,000 and shall continue until the Fund again reaches $250,000,000. All sums recovered by the Fund from the party or parties responsible for a discharge under the provisions of this Act shall be deposited in the fund and included in calculating the balance. All sums not needed for the purposes specified in subsection (b) of this section shall be prudently invested in income-producing securities issued by the United States and approved by the Secretary of the Treasury. Income from such securities shall be applied to the principal of the fund.

"(3) Each person responsible for contributing to the fund in accordance with this subsection shall keep such records and furnish such information as the Administrator shall prescribe in regulations. Collection will be at such times and such manner as shall be prescribed in such regulations.

"(4) Whenever the money in the fund is less than the

claims for cleanup costs and damages for which it is liable under this section, the fund shall borrow the balance required to pay such claims from the United States Treasury at an interest rate determined by the Secretary of the Treasury.

"SEC. 507. The Administrator, or the authorized representative of any State, shall act on behalf of the public as trustee of the natural resources to recover for damages to such resources. Sums recovered shall be used to restore, rehabilitate, or acquire the equivalent of such natural resources by the appropriate agencies of Federal or State government.

"FINANCIAL RESPONSIBILITY

"SEC. 508. (a) Each owner or operator of a vessel or an offshore facility and each licensee shall establish and maintain under rules and regulations prescribed by the Administrator, evidence of financial responsibility based on the tonnage of the vessel, the capacity of the facility or deepwater port, and other relevant factors. Financial responsibility may be established by any one, or a combination of, the following methods acceptable to the Administrator: (1) evidence of insurance, (2) surety bonds, (3) qualification as a self-insurer, or (4) other evidence of financial responsibility satisfactory to the Administrator.

"(b) Any claim for cleanup costs and damages by any

claimant or by the fund may be brought directly against the bond, the insurer, or any other person providing financial responsibility.

"(c) (1) Any person who fails to comply with the provisions of this section or any regulation issued hereunder shall be subject to a fine of not more than $25,000.

"(2) The Secretary of the Treasury may refuse the clearance required by section 4197 of the Revised Statutes of the United States, as amended (46 U.S.C. 91), to any vessel subject to this section which has not furnished evidence of financial responsibility to the Administrator.

"(3) The Secretary, in accordance with regulations promulgated by him, shall (A) deny entry to any port or place in the United States or navigable waters to and (B) detain at any port or place in the United States from which it is about to depart for any other port or place in the United States any vessel subject to this section which, upon request, does not produce evidence furnished by the Administrator that the financial responsibility provisions of paragraph (a) of this section have been complied with.

"(d) The Administrator shall increase the requirements established under section 506 and under subsection (b) and (c) of section 504 annually, by an amount equal to the annual percentage increase in the Consumer Price Index.

"CLAIMS, SETTLEMENT, AND ADJUDICATION

"SEC. 509. (a) The Administrator shall prescribe and may from time to time amend regulations for the filing, processing, settlement, and adjudication of claims for cleanup costs and damages resulting from the discharge of oil.

"(b) (1) Upon receiving information regarding a discharge of oil, the Administrator shall publish and distribute in the area of the discharge information and material on the filing of claims.

"(2) Claims shall be filed with the Administrator not later than two years after the date of discovery of damage nor later than six years after the date of the incident which caused the damage. The Administrator shall prescribe appropriate forms and details for such claims, which shall include a provision requiring the claimant to make a sworn verification of the claim to the best of his knowledge. Each person's damage claims arising from one incident shall be stated in one form. Damages not included in the claim at the time compensation is made shall be deemed waived. Upon receipt of any claim, the Administrator shall as soon as practicable inform all affected parties of the claim.

"(3) If the source of the discharge can be determined and liability is conceded, the claimant and the Administrator or the person responsible for the discharge may arrange a settlement which shall be final and binding upon the parties.

If liability is not conceded or if a settlement on the amount of damages cannot be negotiated, any party may request a hearing before an Administrative Law Judge.

"(4) If the source of the discharge is unknown or cannot be determined, the claimant and the Administrator shall attempt to arrange a settlement under procedures contained in regulations promulgated by the Administrator. If a settlement cannot be negotiated, the claim shall be submitted to an Administrative Law Judge.

"(c) (1) The Administrator shall promulgate regulations for hearings before an administrative law judge. The administrative law judge shall have the power to administer oaths, and subpena the attendance and testimony of witnesses, the production of books, records, and other evidence relative or pertinent to the issues presented for determination.

"(2) Upon receipt of a request for a hearing, the administrative law judge shall promptly schedule a hearing to determine the amount and validity of the damage claim. The hearing shall be held in the area where the damage occurred.

"(3) Upon a decision by the administrative law judge and without a request for judicial review, the amount shall be certified to the Administrator who shall promptly

disburse the award. Such decision shall not be reviewable by the Administrator or the Secretary.

"(d) (1) Any person suffering legal wrong, or who is adversely affected or aggrieved by the decision of an administrative law judge may, no later than sixty days after such decision is made, seek judicial review of such decision in the United States court of appeals for the circuit in which damage occurred or for the District of Columbia.

"(2) In any case in which the person responsible for the discharge, or the Administration, seeks judicial review, attorneys' fees and court costs shall be awarded to the claimant if the decision of the administrative law judge is affirmed.

"(e) (1) The Attorney General may act on behalf of any group of damaged citizens the Administrator determines would be more adequately represented as a class in the recovery of claims under this section. Sums recovered shall be distributed to the members of such groups.

"(2) If, within ninety days after a discharge of oil in violation of this title has occurred, the Attorney General fails to act on behalf of a group who may be entitled to compensation in accordance with section 502 any member of such group may maintain a class action to recover such damages on behalf of such group. Failure of the Attorney General to act in accordance with this subsection shall have no bearing

on any class action maintained in accordance with this subsection.

"(3) In any case where the number of members of the class exceeds one thousand, publishing notice of the action in the Federal Register and in local newspapers serving the areas in which the damaged parties reside shall be deemed to fulfill the requirement for public notice established by rule 23(c)(2) of the Federal Rules of Civil Procedure.

"(f) The Administrator shall initially request the Attorney General to promptly institute court actions and to appear and represent the Administration or the Fund for all claims under this title. Unless the Attorney General notifies the Administration that he will institute such action or will otherwise appear within a reasonable time, attorneys appointed by the Administrator shall appear and represent the Administration.

"PUBLIC ACCESS TO INFORMATION

"SEC. 510. (a) Copies of any communication, document, report, or information transmitted between any official of the Federal Government and any person concerning liability and compensation for damage resulting from the discharge of oil shall be made available to the public for inspection, and shall be available for the purpose of re-

production at a reasonable cost, to the public upon identifiable request.

"(b) Nothing contained in this section shall be construed to require the release of any information of the kind described in subsection (b) of section 552 of title 5, United States Code, or which is otherwise protected by law from disclosure to the public.

"ANNUAL REPORT BY ADMINISTRATOR

"SEC. 511. Within six months after the end of each fiscal year, the Administrator shall submit to the President of the Senate and the Speaker of the House of Representatives (1) a report on the administration of the fund during such fiscal year; (2) a summary of the management and enforcement activities of the Administration; and (3) recommendations to the Congress for such additional legislative authority as may be necessary to improve the management of the fund and the administration of the liability provisions under this title.

"DISCLOSURE

"SEC. 512. Disclosure of such aspects of ownership and management as the Secretary may determine of each tanker entering United States waters shall be provided no later than sixty days after enactment and no later than January 30 of each calendar year, by all companies owning or operating such tankers which entered United States ports during the previous year. Tanker operators and owners

whose tankers are not covered by the previous sentence and enter a United States port during the following year shall provide full disclosure of operating companies and owners upon entering any United States port for the first time in a given year.

"RELATIONSHIP TO OTHER LAW

"SEC. 513. (a) This title shall not be interpreted to preempt the field of liability or to preclude any State from imposing additional requirements or liability for any discharge of oil resulting in damages or cleanup costs within the jurisdiction of any State.

"(b) Any person who receives compensation for damages or cleanup costs pursuant to this title shall be precluded from recovering compensation for the same damages or cleanup costs pursuant to any other State or Federal law. Any person who receives compensation for damages or cleanup costs pursuant to any other State or Federal law shall be precluded from receiving compensation for the same damages or cleanup costs under this title.

"(c) The United States district courts shall have original jurisdiction of cases and controversies arising under this title, and proceedings with respect to any such case or controversy may be instituted in the judicial district in which any defendant resides or may be found, or in the judicial district in which the damages occurred.

"AUTHORIZATION FOR APPROPRIATIONS

"SEC. 514. There is authorized to be appropriated for the administration of this Act $5,000,000 for the fiscal year ending September 30, 1977; $5,000,000 for the fiscal year ending September 30, 1978; and $5,000,000 for the fiscal year ending September 30, 1979.".

ADDITIONAL STATEMENTS

Prepared Statement of Senator Edmund S. Muskie

Thank you Mr. Chairman for the opportunity to add my comments to the proceedings here today.

I congratulate you for your prompt action in scheduling this hearing to review the capabilities and actions of the Federal Government in responding to the tragic oil spill off Nantucket, which threatens to despoil the beaches and waters of both our states and to disrupt and destroy our marine resources to an as yet undetermined extent. The immediate consequencies of this disaster can be seen in the oil soaked gulls and ducks struggling to shore and in the traces of oil already appearing on some beaches. But we may never fully appreciate the long-range consequences of the tons of oil globules sinking into some of the richest fishing grounds in the Atlantic to continue mixing for the foreseeable future with the basic microscopic nutrients vital to marine life. This toxic mixture may pose the greatest threat to Maine fishermen from he long-range damage to herring spawning grounds.

It is difficult in the midst of massive disaster such as this to chart a reliable course out of the immediate confusion and difficulties in a direction which will avoid future reoccurrences but it appears to me that we need to explore four basic approaches.

1. We have to assure that the full resources of Federal, State, and local governments are brought to bear on the immediate problem of limiting the extent of the disaster.

2. An immediate investigation should be conducted to determine the direct consequencies of the spill to our fishing industry and to our coastal communities to assess the potential damage and identify the need for assistance.

3. We should launch a long-range intensive study of the total consequences of this type of spill on maritime ecosystems to help us as we continue to shape energy policy which will necessarily involve difficult judgments about the risks of oil spills and discharges into our oceans.

4. We should recognize the inadequacy of present international regulation and proceed to establish U.S. jurisdiction over pollution in the area of most direct concern to the United States—the 200-mile zone off our shores, and make clear to polluters that they will be held accountable for their acivities within that zone.

This tragedy occurring 28 miles off our shores dramatically affects our interests and demonstrates again the inadequacy of limiting our attention to the contiguous zone from 3 to 12 miles. It exposes the need for an adequate Law of the Sea treaty which recognizes that pollution control is as vital an area of international concern as navagation and economic exploitation. The failure of the Law of the Sea negotiations to seriously consider pollution control suggests that we in the United States should proceed to establish our own pollution control zone beyond the 12-mile contiguous zone to protect our vital coastal interests and hopefully stimulate international actions addressing the global aspects of this problem.

In that regard I introduced in March 1975 a bill to amend the Federal Water Pollution Control Act Amendments of 1972, and the Ports and Waterways Safety Act of 1972, to extend U.S. vessel pollution control jurisdiction 200 miles from shore.

The Federal Water Pollution Control Act Amendment of 1972 and the Ports and Waterways Safety Act of 1972 affirm our country's jurisdiction over pollution from vessels in our territorial seas, which presently extend 3 miles to 12 from our coastline.

The Ports and Waterways Safety Act mandates the Secretary of Transportation to promulgate design and construction standards with which all vessels of certain cargoes must comply for the purposes of reducing the pollution of our territorial seas and our coastline.

The Federal Water Pollution Control Act gives the Administrator of the Environmental Protection Agency authority to establish liability and penalty limits for discharges of oil and hazardous substances into the navigable waters of the United States. It also gives the Environmental Protection Agency authortiy to establish standards of performance for vessels to control the discharge of sewage into the navigable waters of the United States.

The bill which I introduced would extend these same jurisdictions to a limit of 200 miles. It would continue to require the Secretary of Transportation to

promulgate regulations to achieve the objectives of the Ports and Waterways Safety Act, and it would require the Administrator of the Environmental Protection Agency to set limits of liability for discharges of oil and hazardous substances and standards of performance controlling the discharge of sewage from vessels in the 20 miles zone, just as he presently has that responsibility out to the 3 to 12 mile limit under the Federal Water Pollution Control Act.

It is ironic that at the international level, we are still applying 19th century navigational standards and cargo safety principles to the 20th century maritime industry with its massive tankers and ultra-hazardous cargoes. The technology to achieve improved control is available and we can rapidly improve navagation and cargo safety practices in the maritime trade to the high standards we have applied to airborne commerce if we recognize the urgency of the need and make a real commitment.

Pollution of our coastal waters, our coastline, and the oceans from myraid sources continues at an accelerated rate. There is no need to detail the increasing threat that oil pollution from vessels poses to the marine coastal environments of this Nation. The significance of this threat is underscored by a study of the National Oceanic and Atmospheric Administration which recently found that "oil globules—in massive proportions infect nearly 700,000 square miles of blue water from Cape Cod to the Carribean Sea."

The spill you are examining today will add thousands of tons of additional oil globules to that grim scene on our seabeds. The waters surrounding the United States and the U.S. coastline continue to be polluted by discharges of oil, hazardous substances, and sewage from vessels, creating substantial hazards to the resources of the marine and coastal environments including fish, shellfish, wildlife, marine and coastal ecosystems, and recreation and scenic values.

The spill off Nantucket is less than 1 week old but it is already a matter of history and we will never be able to full exert the consequences. I encourage the Coast Guard and other involved agencies to continue their efforts to control, the dispersion of the oil and encourage them to proceed with all their vigor. No resource should be spared in mitigating the damage.

Our next real task now is to launch an immediate intensive study of the oil discharged from the *Argo Merchant* to trace its dispersion, evaluate its immediate and potential interaction with sea water and try to anticipate the impact of the spill on the marine life and coastlines in the area. Our fishermen and coastal residents have an immediate interest in knowing to what extent a spill of these proportions will disrupt their day to day fishing activities. We have reports already of some vessels and gear encountering problems with the slick and shellfish smeared with viscous oil which has settled to the bottom, but we know far too little about the varying reactions of different marine life forms and know far too little about the character of the spill to give our fishermen adequate advice or reassurances as to the immediate future of their industry or to determine what type of assistance might be appropriate. Our coastal communities likewise are anxious about the potential damage to beaches and coastal marine activities. We have an obligation to provide the best possible information to both those groups, and that clearly requires a commitment of resources by the Federal Government through the Coast Guard, Environmental Protection Agency and the National Oceanic and Atmospheric Administration.

Along with an intensive evaluation of the immediate consequences for our fishing industry and coastal communities we should seize this occasion to conduct an intensive study of the long-range ecological consequences of this type of spill on marine life systems. The spill from the *Argo Merchant* is now the largest in United States history but our growing dependence on oil tankers and the general inadequacy of regulation in their tanker transport industry suggest that it may not hold that dubious distinction for long. The debate over controls will be given new impetus by this disaster but unless we gain from this occurrence a more solid understanding of the total consequences of oil spills in our oceans that debate may flounder without achieving a consensus for meaningful actions.

The Coast Guard, EPA and NOAA should commit all available resources to this task and be prepared to advise Congress of additional resources which might be necessary in this undertaking.

I have today written to EPA Administrator Russell Train, to request that this process be commenced immediately. A copy of that letter is attached for the record.

The appropriate total response to avoid future occurrences needs greater definition but it seems clear that we have to exert jurisdiction over the areas of

greatest potential harm to our coastal interests and that is perhaps best defined as our continental shelf or for simplicity a 200-mile coastal zone. We have to make clear immediately to those who dispoil our waters in this area that they will be held accountable for the full extent of damages to all the interests concerned.

PREPARED STATEMENT OF MS. VIRGINIA YOUNGREN, NANTUCKET LAND COUNCIL, INC. AND PEBBLE GIFFORD, MEMBER, LAND COUNCIL AND THE GOVERNOR'S TASK FORCE ON COASTAL RESOURCES

We are here on behalf of the Nantucket Land Council, a citizens' action and lobbying organization on Nantucket, with a membership of around 1,000 people, including both winter and summer residents of the island.

A month ago, I spoke on behalf of the Land Council at the OCS lease-sale hearings in Boston, At those hearings, we joined the many other groups concerned about the obvious inadequacy of cleanup technology as applied to the North Atlantic. Speaking from my own experience, I said that I was not very impressed with the record of Clean Gulf associates in the Gulf of Mexico, and I hoped that that record would not be accepted as sufficient proof of cleanup capability. I noticed that those speakers who were most confident about present technology avoided mentioning the more ominous and destructive Santa Barbara spill and confined themselves to the Gulf of Mexico. But the Gulf of Mexico is a bathtub compared to the North Atlantic, and an oily bathtub at that.

Our Nantucket selectwoman, Esther Gibbs, summed up present cleanup technology as applied to the North Atlantic in a way that was very pithy. Of the *Argo Merchant*, she said, "Why didn't the Coast Guard set the damn thing on fire in the first place. I don't know why they were ever hopeful of getting the oil off. The sea is never calm enough to do that in the winter."

Well, there is no point in second-guessing the Coast Guard. And putting the blame on the tanker captain is not a long-range solution—although we could surely do something to keep such negligent vessels out of one of the best fishing grounds in the world.

However, the Nantucket Land Council is not here to say, "I told you so," or to fix blame, but to take the longest view possible of what has happened.

First, we ask you office to put the full power of its influence and energy behind the allocation of all possible Federal funding to the area. It was educational on the television news to watch everyone passing the buck, in terms of who owns the oil and who has to pay for the cleanup. We ask your office to see that Federal relief gets where it needs to go and fast.

Looking farther ahead, we would like to reiterate our pessimism about OCS drilling as currently proposed. The draft environmental impast statement regarding leases in the Georges Bank area, prepared by the Interior Department, is based almost entirely on the assumption that tankers rather than pipeline will be used. Quoting from volume 2, p. 631 of the draft impact statement:

> It is more probable that tankers rather than pipeline will be used to transport any oil found in the North Atlantic from platforms to existing or future refineries.

We believe that the entire draft environmental impact statement should be reviewed with a very skeptical eye, in the light of what has happened. A speaker at those same OCS hearings a month ago referred to environmental groups as "bleeding-heart bird watchers." But what we were talking about at those hearings was not birds alone but two of the most succesful industries in the New England area—fishing and the resort industry—both of which are now severely threatened by the oil spill.

Who will pay for this and future spills? (Who, that is, besides the American taxpayer). This question must be firmly answered before the Federal Government proceeds with the lease sales. It seems to be human nature—and the nature of our lumbering bureaucracy—that there must be a crisis before anything ever gets done. We think that your office knows how to get things done, and we look to you for action.

In sum, we ask you to use your full influence to enforce the position that cleanup capability should be proven *before*, not after, leases have been acquired, drilling has started, and tankers have begun making routine daily trips back and forth across Georges Bank.

PREPARED STATEMENT OF THE NATURAL RESOURCES DEFENSE COUNCIL OPPOSES PLAN FOR OIL LEASING ON THE GEORGES BANK

The Natural Resources Defense Council is today submitting comments to the Interior Department on the draft environmental impact staement (DES for offshore oil drilling in the Georges Bank region of the North Atlantic. NRDC opposes the proposed OCS lease sale 42 both because the environmental controls to be placed on projected OCS activities are inadequate and because the DES does not satisfy the requirements of NEPA.

NRDC's position is reinforced by the recent disastrous oil spill from the *Argo Merchant* in the same region where OCS operations are expected to take place.

NRDC made its determinations after evaluating the U.S. Geological Survey's study which established that at least one major spill is likely to occur if the sale is made. Also considered were the Interior Department's admission in the DES that no major improvements in oil spill containment technology are expected in the foreseeable future and the fact that tankers would be used to transport Georges Bank oil.

The primary lesson of the *Argo Merchant* spill is that existing technology is totally inadequate to contain tanker spills in the rough seas of the North Atlantic. Proceeding with lease sale 42 would greatly increase the likelihood of another spill as serious as that of the *Argo Merchant*. Moreover, since the oil from the *Argo Merchant* spill may seriously injure the Georges Bank fishery, a complete evaluation of this impact must be completed prior to any decision to lease in the same area.

The Interior Department has not stated in the DES that maximum environmental safeguards will be required. For example, no requirements are established for the use of pipelines in oil transport, for the employment of "best available technology" in operations, for termination clauses in leases if adverse environmental impacts result, or for adequate input from state and local governments.

The deficiencies of the proposed program, combined with the negative effects of the *Argo Merchant* spill, compel NRDC to conclude that OCS lease sale 42, as proposed, should not be held.

PREPARED STATEMENT OF THE COUNCIL OF AMERICAN MASTER MARINERS, INC. ON THE MATTER OF ESTABLISHING A SYSTEM OF SHIPPING SAFETY FAIRWAYS ON THE ATLANTIC OUTER CONTINENTAL SHELF

(By Captain K. C. Torrens, President of the Council of American Master Mariners, Public Hearing on Proposed North Atlantic OCS Oil and Gas Lease Sale No. 42 in Boston)

DECEMBER 8, 1976.

The Council of American Master Mariners, Inc., is a professional, nonprofit, association of shipmasters who now command, or have commanded American Flag oceangoing vessels. The stated objectives of the Council are to render a public service by voicing, as the need arises, the opinion of distinguished master mariners concerning professional subjects of a common interest to them and of concern to the maritime industry. It is a recognized obligation of the Council to take such action as deemed appropriate, to promote the prosperity of the American Merchant Marine and to endeavor to make it of maximum benefit to the nation.

The Council is deeply concerned that the Draft Environmental Impact study for the North Atlantic OCS Area proposed sale 42 in the area of Nantucket and George's Bank has not dealt positively with the impact on shipping. It seems inconceivable to consider construction of obstructions to navigation at one of the most heavily trafficked crossroads of the high seas without evaluating the risk of collision between vessels and drilling structures and providing means by which vessels can safely transit these areas to their destinations.

When drilling commenced in the Gulf of Mexico little consideration was given to this problem and apparently no one envisioned the great number of rigs, obstructions and pipelines that would develop. When it became obvious to all parties concerned that the situation was becoming intolerable a concerted effort was made to attempt to solve the problem before a casualty occurred. After many compromises a system of Shipping Safety Fairways and anchorages was agreed upon and established by the Army Corps of Engineers to provide safe access through the then existing obstructions. These fairways are corridors, delineated

on navigation charts, in which the Army Corps of Engineers will not issue permits for drilling. Today with many thousands of drill rigs and obstructions in the Gulf the fairways remain clear and have proven their value by minimizing the chance of collision.

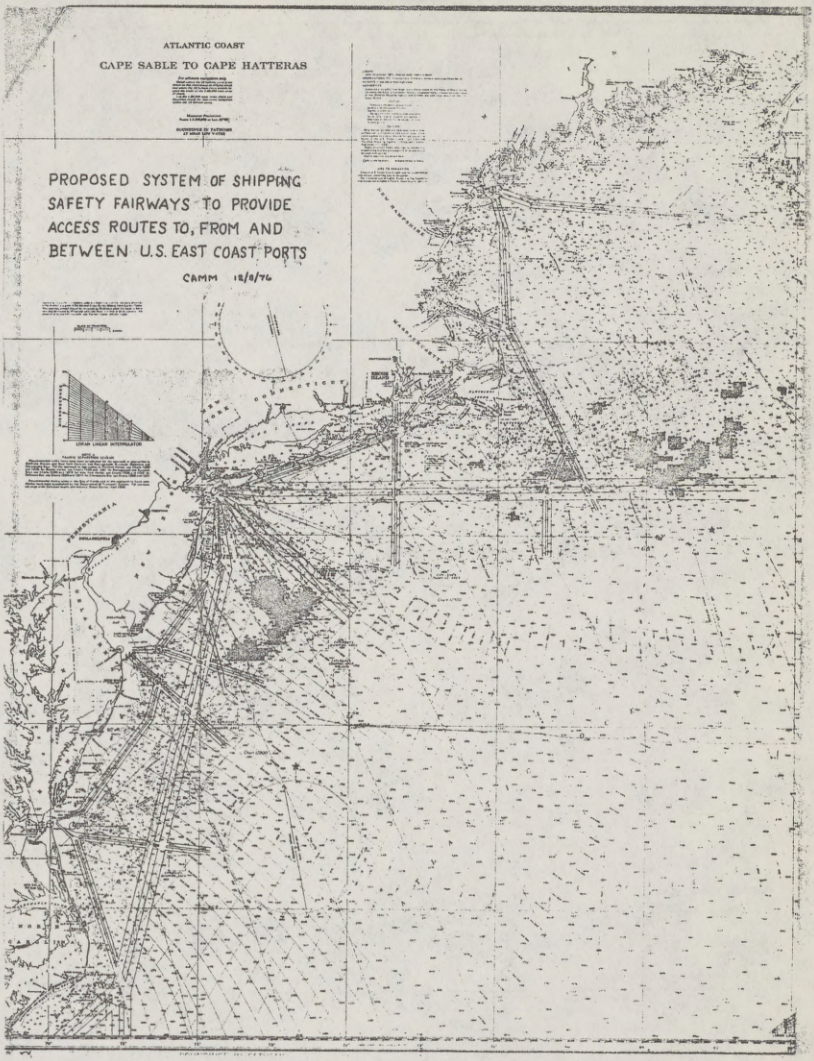
This accepted concept should have greater merit in the Atlantic Outer Continental Shelf and particular in the area of sale 42 due to the greater number and size of vessels; the wind, sea and conditions of visibility; the aggrevated consequences of any collisions between vessels or with rigs and the accuracy and reliability of aids to navigation. Supertankers, large bulk carriers, passenger ships, LNG (Liquified Natural Gas Carriers), barge carriers and in fact practically all vessel traffic from Europe and the Mediterranian to East Coast ports converge on Nantucket Light Vessel along with traffic from Canada, the Great Lakes and North/South Coastwise. Especially during winter months Georges Bank is notorious for violent storms and restricted visibility due to fog or snow. In recent years, a Texas tower was lost in this area with all hands during such a gale. Any collision involving vessels of this magnitude with potentially hazardous cargoes under the weather conditions that may be anticipated would obviously result in aggravated loss of life and pollution. Vessels making a land fall on Nantucket light vessel after crossing the Atlantic under the prevailing weather often are unable to fix their position accurately while still outside visual or radar range of navigational aids or land masses.

The Council of American Master Mariners proposes that Shipping Safety Fairways be established along the East Coast of the United States and across the outer continental shelf as delineated on the attached charts. The fairways shown were determined after careful study by knowledgeable Master Mariners taking into account existing traffic routes and density, depth of water, obstructions and navigational aids. The proposed system incorporates and extends to the 1000 fm curve, the existing traffic separation schemes and establishes inshore fairways 5 miles wide with a one mile wide centerline zone in which drilling could be permitted. Efforts were made to minimize interference with areas of particular interest for oil exploration without excessive deviation from existing routes. Although they may not be visible on the surface of the ocean these routes do in fact exist and are as well defined as the Interstate Highway network on the road map. It is also proposed that the U.S. Coast Guard establish additional aids to navigation as required to assist vessels in locating their position to transit these areas.

The time to establish such fairways is prior to the sale of leases so that all parties concerned will be aware of their existence and of any restrictions that may be placed on the construction of drilling rigs. One Mid-Atlantic Sale No. 40 has already taken place this year and already 30 applications for drilling structures have been received by the Corps of Engineers. Fortunately these sites are not in way of the proposed Fairway.

Should oil production in these areas develop to the extent that drilling within these corridors would be in the national interest then a viable means should be established to modify the fairways as required and after agreement has been reached between Corps of Engineers, U.S. Coast Guard, Bureau of Land Management and all interested parties. It is important that a uniform system and procedure be followed all along the East Coast and the Council stands ready to assist in any way required in establishing such a system so that vessels and drilling rigs can coexist safely on the outer continental shelf.

Enclosed: 2 Charts.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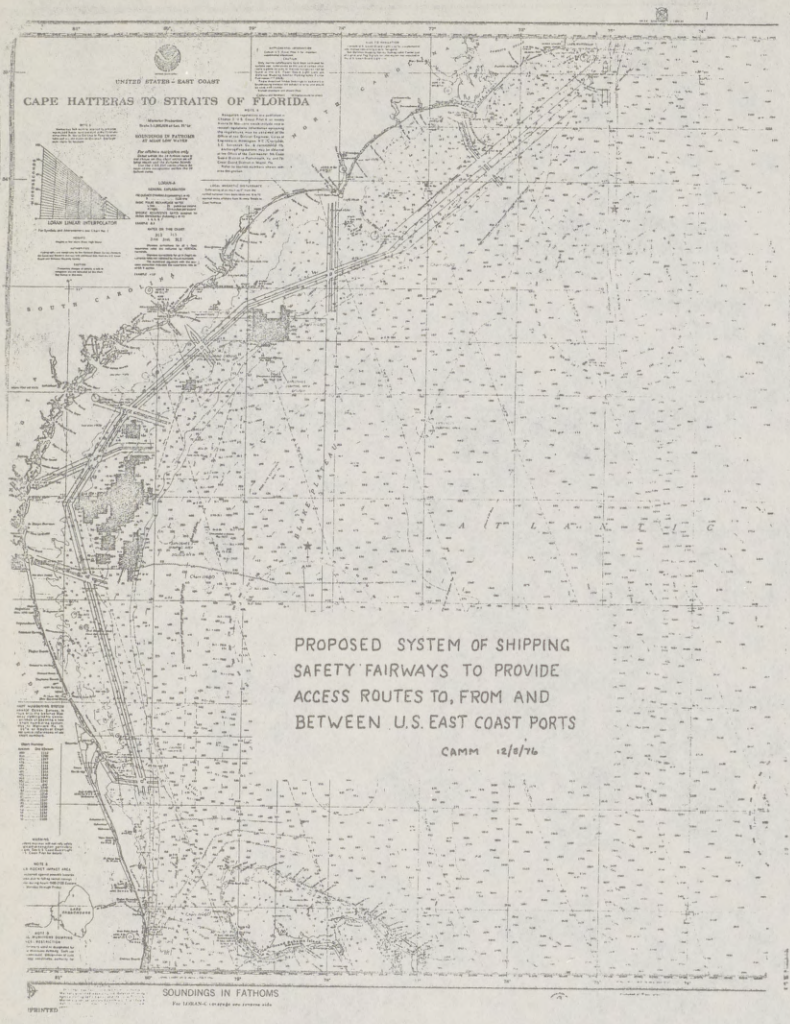
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SOUNDINGS IN FATHOMS

NEWSPAPER ARTICLES

[From the Boston Globe, Dec. 16, 1976]

LEAKING TANKER STUCK OFF NANTUCKET

(By Ken O. Botwright, Globe staff)

A Coast Guard cutter evacuated most of the 38-member crew of a 640-foot Liberian tanker which ran aground about 7 a.m. yesterday, 27 miles southeast of Nantucket with a cargo of 7.5 million gallons of fuel oil .

The Argo Merchant, bound for Salem from Venezuela, was leaking a small amount of oil, and a team of Coast Guard specialists was dispatched by ship from Woods Hole last night to prevent a possible major spill.

The team chief, Lt. Comdr. Barry Chamblers, told Associated Press the mission could be the toughest his group has ever tackled.

"It's bad out there" on the Nantucket Shoals, he said. "This is going to be rough."

Damage control parties from two Coast Guard vessels on the scene were sent aboard the tanker to combat engine room flooding and cargo leakage.

Efforts to free the tanker Argo will undoubtedly be hampered by the weather today.

Rain will close in on the area south of Nantucket; fog banks will develop; temperatures will drop toward freezing, and seas will grow to 8 feet or more, according to a predictions of the National Service.

To worsen the job, which will be tried in the open sea, winds will increase to as much as 30 m.p.h., causing seas to break heavily across the shoals.

"The engine room flooding is not under control, and the water is reportedly 15 feet deep in the engine room," Coast Guard spokesman Richard Griggs reported in Boston late yesterday afternoon.

"The ship is rocking back and forth and taking water over the port side from 10-foot seas whipped by 15 m.p.h. winds.

"The oil slick at this time is not major—about two feet wide and 200 feet long."

A Coast Guard spokesman said last night that the leak appeared to have stopped but that "an extremely thin layer of oil stretched for several miles, at times as wide as the ship."

Griggs said the Coast Guard had no "immediate indication the tanker is in danger of breaking up." In fact, he added, there was a possibility it could be towed ashore or to a safe refuge on this morning's 7:19 high tide, to be off-loaded by another thanker."

The Coast Guard learned shortly after 7 a.m. that the Argo Merchant was grounded from its midships section to the stern on Nantucket Shoals. The ship sailed from Venezuela Dec. 5 and was to have unloaded its cargo of 180,000 barrels of No. 6 residual fuel oil sometimes yesterday at the Salem terminal of the Chelsea-based Northeast Petroleum Corp.

Four Coast Guard helicopters from Cape Cod flew to the stranded ship and arrived between 8:30 and 9. The copters were to evacuate the tanker's crew if necessary, but the ship's master said he'd rather keep the crew aboard, according to Griggs. The captain reported none of his men injured.

At the request of the captain, the helicopters lowered several pumps to help the seamen deal with engineroom flooding. Then three of the aircraft returned to their bases near Sandwich.

The Coast Guard also diverted the cutters Sherman and Vigilant from fisheries patrol duties, and they arrived alongside the tanker at about 11 a.m. The cutters sent damage-control parties and more pumps aboard the Argo Merchant.

About 2 p.m. the Sherman took off about 25 of the tanker's crew.

Because the tanker had developed an oil leak, the Coast Guard alerted its Atlantic Strike Team—specialists in controlling oil spills——at Elizabeth City, N.C. The team and seven tons of equipment flew to Cape Cod and were due to sail to the tanker last night aboard the cutter Bittersweet, out of Woods Hole.

"We have a small slick now, and there's nothing much that can be done about the oil already lost," Griggs said, "Our aim now is to prevent a further spill.

Chambers said his 4-year-old group would first try to pump some of the oil from the Argo Merchant into another vessel, thus lightening the tanker and making it possible to float it off the shoals. If that worked, the tanker would be towed to more sheltered waters and completely unloaded.

He said the job could take a week because his men would be hampered by working in rough, open waters, in cold weather.

He noted that his team had aided 12 grounded ships and, that all missions were successful. His most difficult job was pumping 8 million gallons of oil off a supertanker aground near Chile. The job took 54 days.

The last major oil spill to hit Cape Cod occurred Sept. 16, 1969 when the tanker Florida ran aground in Buzzards Bay and spilled nearly 185,000 gallons of fuel oil. It was "an environmental disaster" and the area's shell-fishing industry still hasn't recovered, according to marine biologists.

[From the Boston Globe, Dec. 18, 1976]

COAST GUARD FEARS TANKER "CATASTROPHE"

(By Ken O. Botwright, Globe staff)

A leaking Liberian oil tanker, aground off Nantucket since Wednesday, is "a catastrophe which poses potential great threat" to the beaches and shellfish beds of Cape Cod and the islands Rear Adm. James P. Stewart warned yesterday.

Last night, a coast guard spokesman at salvage operations headquarters on Cape Cod estimated that "an oily sheen" covered an area of 25 square miles.

Stewart said that although the hull of the 840-foot Argo Merchant appeared to be still intact, heavy fuel oil continued to leak from the vessel, loaded with 7.5 million gallons.

And with prospects of worsening weather today, the Coast Guard First District commander said he was less optimistic than he was Thursday about saving the ship and averting a major oil spill.

However, he said Coast Guard, Navy and civilian salvage experts were meeting last night on Cape Cod to consider whether the tanker could be refloated and unloaded.

Stewart and his marine safety chief, Capt. Walter Folger, refused to speculate at a news conference whether the ship was in immediate danger of breaking up on sandy shoals 27 miles southeast of Nantucket. "But obviously, the longer she remains on the shoals, the greater the danger becomes," said the admiral.

Meanwhile, state Environmental Affairs Secretary Evelyn Murphy sounded an alarm about the dire consequences of an oil spill on shellfish, finned fish, and seabirds. Under a contingency plan, the state has alerted an oil spill cleanup firm and has asked for possible assistance from other spill-battling organizations in other states, she said. Two state boats with cleanup equipment are standing by at Woods Hole.

Stewart said reports from Coast Guard ships and aircraft on the scene indicated "there has been no major spill" from the tanker, which was bound from Venezuela for Salem when it ran aground in about 30 feet of shoal-filled water. However, "a sheen about 150 yards wide and a considerable distance long" extended from the abandoned ship earlier yesterday.

The oil could be leakage from the ship's 30 tanks or residue from pumping operations, which a team of Coast Guard oil spill experts discontinued before abandoning the tanker in bad weather late Thursday night, according to the admiral. The captain of the 23-year-old vessel and the last six members of his 38-member crew were evacuated Thursday to Nantucket.

Stewart said the escaping oil was drifting south, away from the Cape and the Georges Bank fishing grounds, toward the Gulf Stream "where it would do no great harm."

However, he cautioned, the oil continued to be a "grave and imminent threat to our shores because the wind could turn around and blow it in our direction."

Dean Bumpus, a senior scientist in physical oceanography at the Woods Hole Oceanographic Institute, agreed that "it depends a lot on the wind." He said in an interview, after a conference with other scientists and Coast Guard experts, that prevailing winds from the northwest would tend to drive the oil out to sea.

But another danger would be oil adhering to particles in the sea water, drop-

ping to the bottom, and endangering "bottom fauna, on which bottom-fish like flounder and cod feed."

Folger theorized that if the Argo Merchant's tanks did rupture, spilling the 7.5 million-gallon cargo—if refined, was enough to heat 6500 average-sized houses for an entire New England winter—the heavy oil would be easier to clean up than a lighter variety Folger said the oil would go ashore as tar balls.

"If a major spill occurred, our first priority would be to protect and clean up our shoreline," Folger said. "There's not much we could do about it on the high seas."

Reviewing the maritime accident, Stewart said the Coast Guard had no idea why the Argo Merchant—owned by Thebes Shipping Inc. of Liberia—ran aground around 7 a.m. Wednesday in an area well-marked by buoys and other navigational aids.

"We questioned the master, but he was tight-lipped," Stewart observed.

(The captain and crew—evacuated from their ship by the Coast Guard—reportedly were staying in Nantucket but could not be reached by reporters yesterday.)

He added that the Coast Guard "has no authority to open an inquiry because the incident occurred on the high seas."

Soon after the tanker grounded, the Coast Guard cutters Sherman and Vigilant and several helicopters transferred damage control teams and pumps aboard to help combat engine room flooding. Wednesday afternoon, 31 crewmen were evacuated from the listing, rocking, wave-swept ship.

On Thursday, oil spill specialists from the Coast Guard's Atlantic Strike Force and heavier pumps were sent aboard. The specialists tested 25 of the tanker's 30 oil tanks, continued Stewart, and they found water in the tanks was "forcing out oil the consistency of toothpaste."

Later Thursday, the last seven crew members of the tanker were airlifted off. And by 9 p.m., the Coast Guard party "had lost control of the engine room flooding" and asked to be evacuated, too. The Coast Guard Strike Force men said they were concerned that the ship's hull might be buckling.

Yesterday afternoon, three of the 10 available Strike Force men were taken to the tanker about noon by helicopter "to survey the condition of the hull and tanks." They reported to the salvage experts meeting at the Coast Guard air station at Otis Air Force base.

The experts' first priority "would be to get the ship off the shoals intact," said Stewart. If that couldn't be done, then an attempt would be made to transfer the Argo Merchant's cargo to two barges (one was towed from the Cape Cod Canal to the scene and another is en route from Connecticut).

The admiral estimated unloading would take "two to five days" using high-capacity pumps that can pump 1600–1800 gallons a minute "if the oil doesn't cool down and become too viscous."

Worsening weather today—winds increasing from 10 knots to 20 or 30 and waves rising from four to 12 feet— "will make work difficult."

The admiral said he was checking with Coast Guard legal officers "about question of liability."

Secretary Murphy said the state "is also most concerned about the legal ramifications of the spill if it affects the state's marine resources or any personal or real property." She said only one Federal law provides liability upon the spiller, limiting liability "to $100 per ton or $14 million, whichever is less." The liability covers cleanup costs and not property damage.

The commonwealth has a tougher law "providing liabilities for costs of containing or removing oil and (the spiller) is liable for all damages done to natural and recreational resources and the costs incurred to restore those areas." The spiller in addition is liable for "any damage to real and personal property."

The Argo Merchant's cargo—reportedly valued at $2 million—was destined to be delivered to the Salem terminal of the Northeast Petroleum Corp. of Chelsea.

[From the Boston Globe, Dec. 18, 1976]

SPILLING OIL IN THE SEA

The 7.6 million gallons of heavy oil locked in the cargo tanks of a grounded ship 27 miles off Nantucket are a time bomb the commonwealth is virtually helpless to defuse.

The potential threat to some of this state's most valuable resources that a major spill from the disabled and storm-tossed Argo Merchant poses should alert every citizen to our vulnerability to oil spills at sea. And it should spur activity in the Legislature, if not the Congress, for broad protections against financial and environmental catastrophes from oil spills.

Oil tankers travel ocean routes that lie in or near the richest fishing grounds of the east coast as well as the most pristine recreational beaches. The Argo Merchant was making way in such a route near Nantucket shoals when it ran aground Wednesday.

Sometimes the tankers carry relatively "light," clear oil products such as No. 2 heating oil that do not have the tar-like consistency of crude oil.

It was No. 2 fuel oil that a barge was carrying near Woods Hole in September 1969 when it ran aground, eventually dumping 220,000 gallons of deadly pollution into West Falmouth Harbor. The damage to shellfish, birds and beaches from that spill has not been undone yet, according to scientists at the Woods Hole Oceanographic Institute, even though the spill was small and the pollutant relatively mild.

But the cargo in the tanks of the Argo Merchant is No. 6 bunker fuel, at least as dirty as crude and as difficult to control when unleashed into the sea.

Not only do spills cause devastating damage to wildlife, but they are costly to clean up and potentially ruinous to industries such as tourism that depend on good beaches, fishing and boating for their viability.

Because of this economic danger, Sen. William Bulger of Boston and Rep. Richard Kendall of Falmouth have twice sponsored bills, which twice failed to get out of the Ways and Means Committee in Massachusetts to establish a $10-million fund for a state bureau to pay for cleaning up spills and to reimburse people whose livelihoods or properties have been economically damaged.

The fund would be financed by a 1 cent levy on every barrel of oil (55 gallons) that is brought into Massachusetts by tanker or pipeline. The oil industry opposed the bill, claiming that a Federal approach would be better than having different rules set in the different coastal states.

But the industry also opposed a bill, sponsored by Rep. Gerry Studds (D-Mass.), to do virtually the same thing for all the coastal states.

The present law provides a limited payment of up to $14 million, but only for cleanup. The Government is supposed to replenish the fund by successfully suing offending shipowners or rig operators.

Congress had to allocate $5 million to the fund last September because it had been depleted by claims and not refilled. It is this fund that Massachusetts, without substantial cleanup resources, will have to rely on if the Argo Merchant cargo ends up on our beaches.

Both the state legislature and the Congress must protect the public interest with legislation that will force the oil industry to take greater measures to avoid spills (double-hulled tankers would help, as would more stringent measures to avoid deliberate dumping). And legislation should have built-in incentives, such as the Studds bill proposed, to ensure swift cleanup for even the most impoverished state in the event of a spill.

The oil industry through inaction, short-sightedness or lack of concern is threatening our beaches and our livelihoods. The Argo Merchant mishap is a reminder that the industry must be held responsible.

[From the Boston Globe, Dec. 20, 1976]

TANKER BLAST CAUSE A MYSTERY

LOS ANGELES (UPI)—The source of an explosion which shattered an 810-foot oil tanker here remained a mystery yesterday but the Coast Guard said it could "speculate that someone violated a safety rule somewhere."

A California official said the disaster would have an impact on plans to unload Alaska pipeline oil. The oil, when it becomes available in 1978, would be carried on tankers with twice the capacity of the Sansinena, which was involved in the explosion.

Eight persons, possibly nine, were dead or missing and 50 injured in the aftermath of the huge explosion Friday night. Divers searched the oil-slicked waters of the San Pedro dock for more bodies.

An insurance underwriter's spokesman said damage would probably exceed $5 million, in addition to the loss of the ship and liability for death and injury.

The Coast Guard ordered an inquiry convened early this week. A spokesman said it might require 2 to 3 weeks.

The explosion aboard the 38,000-ton Liberian-registered tanker occurred at 7:40 p.m., after it had unloaded a cargo of Indonesian crude oil. It was scheduled to sail at 10 p.m.

The Coast Guard said there were five known dead, all Italian crew members of the Sansinena, and four missing. Coroner Thomas Noguchi said, however, that only four bodies had been recovered.

Tom Quinn, a top aid to Gov. Edmund G. Brown Jr. and head of the state's Air Resources Board, said the disaster points up the need for the state to "get into the tanker safety business in a big way."

California has been rasing repeated objections to the proposal by Standard Oil Co. of Ohio to build a tanker terminal in the Port of Long Beach, which is part of the Los Angeles harbor complex. The terminal would be used to unload up to 700,000 barrels of Alaskan crude oil a day beginning in 1978.

Asked if the Sansinena explosion would have an impact on whether the facility would be permitted, Quinn said: "I think it obviously will."

[From the Boston Globe, Dec. 20, 1976]

NEW FIGURES ON SPILL: 1.5 MILLION GALLONS OF OIL LOST

(By William B. Hamilton and Richard Hudson, Globe staff)

The Coast Guard yesterday stepped up its preparations for removing the tanker *Argo Merchant's* remaining cargo of No. 6 residual oil, but said that 1.5 million gallons—twenty percent of the Liberian-registered ship's cargo—had already leaked into North Atlantic waters.

Coast Guard officials, who on Saturday had estimated that 140,000 gallons had leaked from the 18,743-ton 641-foot tanker, revised their estimates yesterday morning after receiving reports from aboard the ship, which ran aground last week 27 miles southeast of Nantucket. Winds and currents thus far have carried the oil away from land.

Because an immediate scientific evaluation could not be obtained, it was unclear last night what effect such a large amount of oil will have on marine life in the area.

The officials said they hope to begin pumping oil off the tanker sometime between tomorrow and Thursday in an operation that could take as long as a month to complete and cost over $1 million. Both the time the pumping will take and when it will start, they said, depend on the weather, and on the Argo Merchant's ability to ride out rough seas.

The possibility that the ship might break up before all the oil is removed remained the greatest fear of those involved in the complex operation to prevent much greater spillage. This fear is particularly acute since the weather is expected to get steadily worse today, with winds as strong as 50 knots (about 60 miles per hour) possibly by tomorrow morning.

"Frankly, it's my opinion that if the *Argo Merchant* is out there for an extended period of time and we have winds that are 50 knots there's a good chance she could break up," Rear Adm. James P. Stewart, commander of the 1st Coast Guard District, said at a news conference in Boston yesterday.

For the time being, at least, there is little danger that the estimated 1.5 million gallons of oil that has already leaked from the ship since it ran aground last Wednesday night will reach shore areas of Nantucket or Cape Code.

The leaking oil is believed to be within a pie-shaped area extending 65 miles east from the ship, away from land. The area is estimated to be 35 miles wide at its eastern end and 10 miles wide at the western end.

If the Coast Guard is correct in its calculations, the oil has now been carried to Georges Bank, a major international fishing area.

The Coast Guard said no oil has actually been sighted in the Georges Bank area. According to officials, however, the No. 6 oil carried by the *Argo Merchant* is heavy and tends to form globules that sink to the sea bottom, coating sea floor—or benthic—life rather than leaving a slick.

The Georges Bank is a spawning ground for herring, cod, flounder, pollock and sea scallops. Also in the area are the nearly extinct gray seals, which feed on bottom life.

Members of a special seven-member Coast Guard antipollution "strike team" which was aboard the Argo Merchant yesterday afternoon reported that the ship's main deck was coated with as much as 2 inches of oil.

"We were slipping and sliding all over that deck—the oil was that thick," said Lt. Cmdr. Barry Chambers, commanding officer of the team, after returning by helicopter to Cape Cod Air Station at Otis Air Force Base in Bourne. "It was pretty difficult to walk. We kept slipping and falling into the oil."

Although the Coast Guard's estimate that 1.5 million gallons have seeped from the *Argo Merchant* is an upward revision of previous estimates, officials said the rate of leakage appeared to have slowed considerably yesterday. They attributed this to the fact that the oil is so cold—making it much thicker—and to the fact that some tanks in the ship are apparently almost empty.

There was enough leakage, however, to cause a visible brown slick extending about two miles south of the ship.

The involvement of the Elizabeth, N.C.-based strike team—one of three the Coast Guard maintains around the country in case of a major pollution danger—is a reflection of the concerted effort the Coast Guard is making to avert more spillage.

An estimated $500,000 has already been spent in the effort, and Hein said he is requesting an additional $1 million from the National Response Center, a consortium of civilian and military pollution experts based in Washington. Hein said additional funds may be needed.

Coast Guard activity yesterday centered on preparing the Argo Merchant for removal of the oil.

In an attempt to prevent the ship from shifting on the sandy shoal where it went aground, the tugboat Sheila Moran towed the Argo Merchant's two anchors out from the ship. Since the tanker is lying on its stern, it was felt that the anchors—one on each side—would act like guy lines in keeping the bow stable.

However, the tugboat succeeded in moving only the port anchor because the tow line to the starboard anchor snapped.

The other objective yesterday was to put in place along the ship's port side two so-called "Yokohama fenders"—18- by 9-foot rubber bumpers which are used to prevent damage to a ship's hull if it bangs against another ship in rough weather.

An Army Skycrane helicopter was used to transport the fenders from Cape Cod Air Station and put them in place on the ship's side. Lt. Cmdr. Chambers said the operation was performed without mishap.

Chambers added that while on board the tanker he and the other members of the strike team had also tightened deck fittings to prevent any further leakage from the ship's 30 oil tanks, set up an electrical generator, strung up lights and put a radio on board.

Today, the Coast Guard plans to begin transporting four destroyer mooring buoys to a position near the Argo Merchant. They will be placed in the water and will be used to moor the two barges into which the oil will be pumped from the Argo Merchant's tanks.

After the two barges are in place, the Calico Jack, a 165-foot vessel used in servicing offshore oil rigs, will be brought into position next to the Argo Merchant.

On board the Calico Jack will be a pump with a capacity—under ideal conditions—of 3,300 gallons per minutes which will be used to remove the oil. Before the oil can be pumped, it will have to be heated so that it will flow more easily, and to do that, a steam-heated coil will be inserted into one of the ship's tanks.

Oil from other tanks will be pumped into the heated tank to be warmed by the steam. From there, the oil will be pumped onto a barge.

Capt. Hein estimated it will take from 2 to 4 days to anchor the moorings, move the barges and the Calico Jack into position, set up the pumps and begin warming the oil.

At the news conference, Adm. Stewart also disclosed that the Liberian tanker had been fined $350 for leaking oil into Boston harbor in August 1975. He said the ship's owners, Thebes Shipping Co. of Monrovia, Liberia, had paid the fine last July.

Because of these past problems, Stewart added, the Coast Guard had planned to send a plane to observe the Argo Merchant as it came into Salem, its destination when it ran aground, to determine whether any oil was leaking.

Adm. Steward indicated that because the Argo Merchant ran aground in international waters, the ship's owners are probably not liable for the costs of the Coast Guard's current operations. In fact, he said, the ship's captain, George Papadopoulos, does not even have to answer to Coast Guard inquiries.

Two barges will be used to transport the oil once it's pumped off the Argo Merchant. One—the Nepco, owned by the New England Petroleum Co.—has a capacity of 72,000 barrels, or 3,960,000 gallons. (There are 55 gallons to a barrel.) The other, the New Jersey, has a capacity of 40,000 barrels or 2.2 million gallons.

The Coast Guard estimates it will take 14 working days to pump the oil off the tanker, but officials conceded at yesterday's news conference that because of the weather it could take as long as a month.

Both Stewart and Hein said it is their understanding that the ship's owners would be liable for damages only if the oil reaches American coastal areas. They added, however, that Coast Guard attorneys are now researching the question.

[From the Boston Globe, Dec. 21, 1976]

FISHERIES THREATENED

(By Robert Cooke, Globe staff)

A vast, undulating blanket of heavy oil washing from the grounded Argo Merchant is already killing sea birds and may do severe damage—both ecologically and economically—to some of New England's richest fishing grounds.

Sea birds by the hundreds, most of them already dead, have begun washing ashore on Nantucket Island, Massachusetts fish and game officials reported yesterday. Many more are expected to perish as oil continues to spread.

The extent of damage both to birds and marine life will depend in part on how much more oil spreads onto the sea, how much of it sinks to the bottom and how far the huge oil slick is spread by wind and waves.

"The No. 6 oil that we're dealing with is considered the very worst kind of oil you can have in winter, because just one spot on a duck starts the duck preening, trying to remove it," said Richard Cronin, deputy director of the state's Department of Fisheries, Wildlife and Recreation Vehicles.

As a duck preens, Cronin said, "he spreads it on his feathers, and this removes the natural oils. Then the water can get in and he dies of cold; his body temperature drops and he dies."

Cronin added that one of the department's enforcement officers, Eddie Metcalf, "began picking up seagulls yesterday, and today he's been picking up eider ducks, loons and golden eye ducks. He's been getting birds by the hundreds. A big percentage of them are coming in already dead. Some are still showing movement, but there's not much hope of rescue."

Fisheries observers also said they are seriously concerned, and a report from the state's Environmental Affairs Office declared that oil spillage from the sticken ship "poses a serious danger to the resources of the Nantucket Shoals area.

"In particular," the report said, "spawning activity of cod may be disrupted, and the eggs and larvae of cod, herring, American dab and sand launce could be affected . . . 'which could' . . . have serious repercussions on the stocks of these species in future years."

The environmental affairs observers added that the area impacted by a large oil spill "is heavily fished for flounder, cod, haddock and sea scallops. The presence of oil would disrupt fishing activity and could result in great losses of income for fishermen and their families."

A marine biologist with the U.S. Marine Fisheries Service in Gloucester, Robert Hanks, commented that "it's not just the adult fish that are of concern."

If heavy oil settles on the bottom, he explained, "either the bottom sediments may be overcoated so there's no proper surface for eggs to attach to, or it may be toxic. Even if the eggs do survive and begin to grow, there are some petroleum fractions, some volatiles, which can cause malformations or can even stop development and cause embryonic mortalities."

"If the eggs have already arrived at a higher developmental stage," Hanks added, "then there is the possibility of impact on the young juveniles, the newly-hatched fish. Oil globules that may be in solution can interfere either with their

feeding systems, clogging them, or it can clog the gills and interfere with the respiration system."

Hanks noted that the same hazards are faced by adult fish, "and it's also possible that some of the chemicals can disrupt normal metabolic processes" in the fish.

There is also a distinct possibility, he noted, that one or more important links in the oceanic food chain—such as shrimp or plankton—could be killed, resulting in a decrease in fish populations higher up in the food chain.

"Fish are lucky in the sense that they are highly mobile," he added. "They can move away from an area if environmental change is slow enough.

"But the sessile (immobile) animals on the bottom, such as the clams and oysters and scallops, would not be able to move away from an area."

If a large bottom area is polluted and sessile organisms are killed, he said, it could take a long time for it to be reseeded naturally and reestablish itself.

Again, this period will depend on how much oil actually reaches the bottom sediments, and also on how wide the area is that is contaminated.

The area being covered with heavy oil is known to be a wintering zone for many sea birds, especially some species from the north. Arnold Julin, an environmental contaminant specialist with the Fish and Wildlife Service, added that the bird problem "has shown up a lot worse than we thought it would. It normally wouldn't be too bad" so far at sea, "but we do have a population of sea ducks out there that this has gotten into."

Similar damage to bird populations has occurred in New England ocean waters in the past. According to a report from the Department of the Interior, two naturalists "observed a decline in the wintering population of common eiders off the Massachusetts coast, from an estimated 500,000 birds in 1952 to 150,000 in 1953."

"They attributed the large population decline to oil spilled by two tankers wrecked in the vicinity of Nantucket in February 1952."

A biologist who is a senior scientist at the Woods Hole Oceanographic Institution, Dr. John Teal, also explained that when birds try to clean themselves off, they swallow some of the oil and get sick. They also get oil in their lungs.

He added that oil-laden birds also tend to sink, being heavier with oil on them, so they struggle and then get tired.

Cronin pointed out that "the distressing part is how the birds got there (to Nantucket) this fast. They may very well have become contaminated" in the spill area some 27 miles east of Nantucket, "then flew away, dropped into the sea and drifted ashore. The distressing thing is that we're finding them along the entire seaward shoreline" of Nantucket.

Cronin also noted that his department's biologists keep track of duck populations at sea off Nantucket.

"Last year, in January, there were about 28,000 birds there. About 17,500 of them were eiders and 7,700 were scoter ducks. We weren't due to count the ducks again this winter until Jan. 4."

Discussing efforts to save oiled ducks that are still alive, Cronin commented that "we'll probably try to look for some rare species and try to save them."

Saving oiled birds, however, is very difficult and it's seldom possible to keep the birds alive.

Joan Irish, of the Massachusetts Audubon Society, said special cleaning fluids, similar to detergents, are used to de-oil birds, "but that takes all the natural oil out of their feathers, and that's terrible. This means the birds can't be released until their next molt, when they got new feathers." Cleaning such birds, too, she said, "is a very complicated process. It takes lots of time and know-how. There is a special solution to use, but it has to be done by experts."

[From the Boston Globe, Dec. 22, 1976]

ARGO MERCHANT BREAKS UP; DIRECTION OF SPREAD UNCERTAIN

IT'S FEAR FOR THE WORST—AND HOPE

(By Peter Mancusi, Special to the Globe)

Millions of acres of one of the world's most fertile fishing grounds could be rendered sterile depending on what direction oil spreads from the broken Liberian tanker Argo Merchant.

State environmental officials, fishing industry spokesmen and scientists agreed yesterday that the oil spill, if carried to the southwestern regions of the 16-million acre Georges Bank, could spell disaster, both financially and environmentally.

A Coast Guard spokesman said last night the oil leaking from the tanker was being carried in a southeasterly direction and had "gone across the southwesterly tip of Georges Bank, but there was no immediate estimate of damage.

He said the wind would continue blowing out of the west at 40 knots into this morning with winds gradually diminishing to 15–20 knots and switch to the Southwest this afternoon. He said a change in wind direction would not necessarily change the direction of the oil spill.

The spokesman said the oil spill is in the shape of a pear and is about 27 miles wide and 90 miles long. He said the spill was about 25 miles from the Argo Merchant last night and the Coast Guard oceanographic specialists predicted it would be 90 miles from the tanker by 6 a.m. today.

David Standley, commissioner of the state's Department of Environmental Quality Engineering said in a telephone interview that if oil contaminates waters in Georges Bank, fishermen could lose as much as 75 percent of their income.

An estimated 30,000 fishermen along the New England Coast make their living in the Georges Bank area, which runs from the Gulf of Maine to southeast of Nantucket. Some officials have estimated that the spill could cause about 10,000 fishermen to lose their jobs and that the $1.2 billion fishing industry may take years to recover.

Standley said his office is studying the possible effect oil may have on fish and shellfish in the area. If most of the oil sinks to the bottom, Standley said that scallop beds, which provide the main catch for fishermen in New Bedford, Chatham and Provincetown, would be most seriously affected.

If enough oil covers the beds, located near the sea floor, some beds could be killed off, he said.

Additionally, the sinking oil could contaminate major sources of food for ground fish—such as plankton and worms—and give the fish an oily taste, making them unfit or undesirable for consumption. While the oil would not necessarily be toxic, most fish would tend to move to noncontaminated areas.

State environmental officials are also worried that oil may interfere with spawning for various types of fish, especially cod. Standley also warned that the oil could spell "doom" for the 10,000 seabirds in the area. Hundreds of seabirds have already washed along the Nantucket shore.

"Right now, it's almost impossible to come up with the possible impact the oil may cause until we know exactly where it is going to go," Standley said.

Scientists aboard the research vessel Oceanus from the Woods Hole Institute, took 19 water column samples yesterday in three areas 40 miles north of the southwestern Georges Bank area. They reported no presence of hydrocarbons—particles of chemicals contained in oil—in the water.

The institute's chief scientist, John Milliman, said, however, that the cruise was "designed to sample an area in the expected path of the oil slick in order to provide background data necessary to evaluate the environmental impact this area might receive from a heavy influx of oil in the near future."

Milliman said that although there were no traces of oil in the water, scientists spotted many black-backed gulls "showing evidence of oil contacts." The scientists, he said, also noted that a "distinct odor of oil was apparent in the air."

Robert Edwards, director of the Woods Hole National Marines Fisheries Service, said yesterday, that the spill could miss the southwest portion of Georges Bank entirely if there are strong northerly winds during the next several days.

"If ocean currents and winds behave as they usually do at this time of year there is a strong possibility that most of the oil will be blown well offshore and may diminish quickly," Edwards said. "The more offshore it blows the more it gets dissipated."

Edwards agreed with most estimates that scallop beds in the area could be quickly affected by the spill. He noted, however, that should most of the spill miss the Georges Bank area, any amount of oil left on waters in the fishing grounds could cause problems.

"A fisherman, for instance, may put down his net in an area not contaminated by oil and begin dragging," Edwards said. "But when he pulls up the net he may pull it through an area of water with a surface film of oil, thereby coating the fish with oil."

Edwards said fishermen may have to fish in narrowly defined areas, which could limit catches. "That of course would be a tremendous inconvenience for the fishing industry," Edwards said. "Fishermen may have to avoid large areas."

In an impact statement released last week by state Environmental Affairs Secretary Evelyn Murphy, officials said the oil spill could reduce fish populations in the southwestern Georges Bank area "in future years." The area is heavily fished for flounders, cod, haddock and sea scallops.

The impact statement also noted a 90 percent fatality rate among pelagic bird populations in areas of major oil spills—especially to eiders, puffins, razor bills, muirres and old squaw ducks.

Scientists from the University of Rhode Island's newly formed Oil Pollution Strike team reported that fishermen 120 miles away from the spill reported that their boats were inundated with oil covered birds trying to land and clean oil from their feathers.

Steve Olsen, one of the teams members, said that if the heavy, No. 6 residual oil does sink into the sand on the ocean floor it could remain there for "several years." He estimated that if the oil remained on the surface it would "weather and breakdown and could be broken up in a matter of weeks."

Thomas Norris, of Boston, the chief spokesman for New England fishing industry, said, "Given the worst of all conditions, it undoubtedly would be a disaster for the New England fishing industry. It will be a disaster if the damned stuff doesn't drift east and off the bank into deep waters."

Norris, who is also vice chairman of the newly established Federal regional commission, which will help administer the 200-mile limit fishing limit of the New England Coast when it takes effect March 1, said the spill could finish off species which have been overkilled by foreign fleets. "You name it and almost every species of fish stock is endangered," he said.

[From the Boston Globe, Dec. 22, 1976]

Bow May be Towed to Sea and Sunk

(By Paul Langner and Fletcher Roberts, Globe staff)

With about 5.5 million of her 7.5 million gallons of heavy oil spilt into the seas off Nantucket, the Liberian tanker Argo Merchant lay jackknifed on the sandy bottom this morning with 15-foot seas pounding her ruptured hull. Oil continued to pour into the sea. The oil-laden tanker had broken up off Nantucket Shoals early yesterday morning after suffering heavy pounding for 6 days. She ran aground a week ago this morning.

The seas were continuing to wash oil out of the remaining 12 tanks that still held oil at the rate of about 10,000 gallons per hour, according to Coast Guard estimates. It was estimated that 73 percent of the oil would have leaked out by early this morning. As of yesterday morning, about 70 percent of the oil had leaked out.

A Coast Guard spokesman said last night that the oil was being carried in a southeasterly direction and had crossed the southwest tip of Georges Bank.

Weather permitting, the Coast Guard plans to stabilize the bow section, where the 12 remaining tanks of oil are located, in 1 or 2 ways.

If possible, plans are to pump oil from the forward three tanks of the 12 tanks in the bow section to the after tanks, which are partially empty. This might make it possible for a tug to wrench the bow section off the sand bar and away from the stern, to which it is still attached by a hull plate.

A second option would be to discharge the oil from the forward three tanks into the sea to lighten the bow section and then to tow the bow off the bar.

If either of these plans succeeds, the bow section will be towed out to sea and sunk, by gunfire, if necessary.

These plans will have to await an improvement in the weather, which got worse during the night. Winds increased and seas which had been up to 15 feet during the afternoon yesterday were reaching heights of 20 feet as night fell.

Meanwhile, the Coast Guard reported that the oil, which had drifted about 55 miles east of the tanker's location by late yesterday afternoon, was extending in the early hours today about 90 miles east of the tanker.

Lt. Cmdr. Barry Chambers, who heads the 20-man special Coast Guard strike team that has been working on the tanker since she ran aground last Wednesday

morning, said that careful studies would have to be made before any pumping could begin.

The bow section of the Argo Merchant broke away suddenly at 8:45 a.m. yesterday and the pounding seas wrenched it around until it formed an angle of 45 degrees with the now-submerged stern section. The bow section is held in place by an anchor that was lowered from the Argo Merchant 2 days ago and by the twisted hull plate attaching it to the stern section. The bow was pointing skyward in a northeasterly direction while the stern section lay on an east-west line. Oil continued to slush out in brown patches and was carried initially southeastward, leaving a metallic, rainbow-colored slick about 80 feet wide, visible for a quarter of a mile.

Chief Warrant Officer Peter Brunk, assistant to Lt. Cmdr. Chambers, discounted fears expressed that heavy oil was sinking and contaminating the penthic, or bottom-dwelling, life. He told the Globe that a similar spill in Chesapeake Bay involving the same grade of oil had not contaminated any of the clam beds.

Capt. Lynn Hein, the Coast Guard officer in charge of salvage operations, said that if the oil is not blown shoreward, there would be no danger to animal life or the beaches. "This kind of oil is biodegradable, and in time, will be consumed by bacteria."

Other marine experts have said that heavy oil such as this coagulates into small lumps and sinks to the bottom, where it coats marine life.

Meanwhile, Gov. Michael S. Dukakis, saying that the stricken tanker poses a very, very grave threat" to the ecology and economy of Massachusetts, asked the White House to declare a national disaster. Similar pleas came yesterday from Senators Edward Kennedy and Edward Brooke and Rep. Edward P. Beard of Rhode Island.

Terming it "the biggest oil spill disaster on the American coast in our history," Russell Train, administrator of the Environmental Protection Agency, told a news conference in Washington that the oil could endager the valuable fishery resources of the Georges Bank for a long time.

The skipper of the ship, George Papadopoulos and several members of his 38-man crew appeared in U.S. District Court in Boston yesterday to file depositions on why the tanker apparently wandered 10 miles off her charted course.

Rep. Gerry E. Studds said yesterday that he will seek a House Coast Guard subcommittee probe of the spill to determine the extent of damages, "explore the need for tighter oil tanker safety regulations" and examine the adequacy of navigational aids in the area.

Legal wrangling continued yesterday in the $60 million damages suit filed against the owners of the stranded tanker by a group of Cape Cod fishermen. The owners of the vessel, Thebes Shipping Inc. of Monrovia, Liberia, have filed a suit in New York City claiming that they can be sued only for the value of the ship and its cargo.

Atty. Frank O'Rourke of Scituate filed suit in U.S. District Court in Boston yesterday on behalf of the Georges Bank geographical area to attempt to force changes in Federal regulations governing oil spills, oil tankers and navigation rules.

The U.S. Attorney's office began looking into whether the tanker was within U.S. jurisdiction when it lost much of its cargo.

Comr. Evan S. Dobelle of the state Department of Environmental Management announced yesterday that his department is establishing an office at the Myles Standish State Park to coordinate volunteer manpower that might be needed if oil from the leaking tanker should reach Massachusetts shores.

Evelyn Murphy, secretary of environmental affairs, who was at the press conference with Capt. Hein and Lt. Cmdr. Chambers, said that two salvage firms, Coastal Services Inc. and Cannon Engineering, were standing by on Nantucket with equipment to go into action if the oil should start movement toward shore.

There seemed little chance of that yesterday as winds and seas continued out of the northwest driving the oil away from land.

If the oil should drift landward, the workers of the two companies would string booms across the inlets of bays, rivers, and tidal marshes.

Previous experience has shown, notably in the spill of diesel oil off Falmouth in 1969, that marine life takes five or more years to recover after such a spill.

Capt. Hein rejected any suggestions of setting fire to the oil to get rid of it. He pointed out that No. 6 oil is difficult to ignite and even if one were to spread magnesium chips and drop incendiary bombs, the waves would soon extinguish any fire since the patches are isolated and small.

Setting fire to the oil would also pose another danger that is not well-known but for which there is at least one case history. In 1968 the Norwegian tanker Polycommander, carrying about 80,000 tons of crude oil, caught fire off the coast of Spain.

The burning oil caused a firestorm that sucked up air into a vertical column. The column carried much of the unburned oil aloft. A few days later, that oil fell as an oily rain on the farms in northern Spain, ruining crops and the land.

Any pumping action the Coast Guard contemplates would have to await better weather. Yesterday's seas were about 15 feet; winds were more than 35 mph gusting up to 45.

The Coast Guard cutter Vigilant, which is standing by the wreck, was rocking in seas that seized her beam and kept rolling her onto her beam ends.

Also in the vicinity was the tug Shelia Moran.

During an overflight yesterday afternoon observers noted that the stern section of the Argo Merchant was totally awash, with only the upper deck of the after deckhouse above the waterline. Surging waves exposed the afterdeck for brief seconds. Besides the upper part of the deckhouse and the funnel, only the davits for the after lifeboats protruded from the water as did the kingposts for the cargo-handling booms.

The forward deck house was almost completely coated with oil, including the flying bridge which is atop the pilot house, the topmost deck on the ship. The halyards are still rigged on both yardarms of the mast and signal flags are still fluttering, but tattered and totally coated with oil so that their colors cannot be read.

Flocks of gulls could be seen circling the cutter Vigilant but all living things seemed to shun the Argo Merchant and her coating of oil—deadly to fish and birds.

Lt. Cmdr. Chambers yesterday, said that when he and his party had first boarded the tanker, they had managed to keep flooding in the engine room, which is located aft, under control. But while they were pumping, they could see the tanks had ruptured and that oil was spreading into all spaces of the ship.

He said that plans had been to put the salvage strike force team aboard yesterday morning, but the Argo Merchant broke in half before the team could be taken out to her.

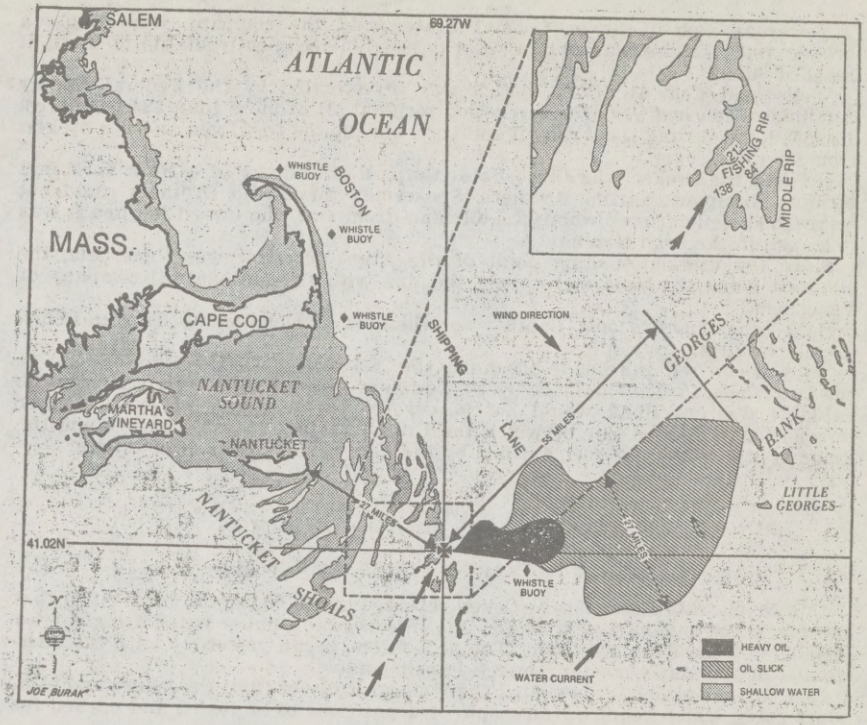
About the future, Lt. Cmdr. Chambers said: "We don't want to let her sit there. We are trying to do something."

Asked if the owners of the ship have offered help, Capt. Hein said that they had, but that he has asked for any gotten a free hand from them. "We don't want to work at cross purposes," he said.

The owners of the ship are Greeks who have American passports and whose effective headquarters are in New York.

Tanker owners a few years ago joined a group called Tanker Owners Voluntary Liability Operation (TOVALOP). Their liability is limited to $14 million per spill. Although the spill is nominally in international waters, the United States is a party to a 1969 convention that imposes heavy fines for spilling oil within 50 miles of land.

A Coast Guard spokesman said last night that the Argo Merchant reportedly left Santa Cruz, Venezuela on Dec. 5 bound for Salem and the Northeast Petroleum Corp.



[From the Boston Globe, Dec. 23, 1976]

STILL DOUBT WHO'S LIABLE FOR CLEANUP, FISH, FOWL

(By Stephen Wermiel, Globe Washington bureau)

The cost of cleaning up the oil spill off Nantucket may be recovered, but the recovery of damages to fish and fowl off Massachusetts "is up for grabs," top Coast Guard officials said yesterday.

"The cleanup costs are the only thing ascertainable at this point," Rear Admiral G. H. Patrick Bursley, chief counsel to the Coast Guard, said.

Speaking at a news conference in Washington, Bursley said, "Recovery of consequential damages is really up for grabs."

Even recovery of the cost of cleaning up the massive oil spill may be held up for a while, according to oil industry sources, because of uncertainty over who actually owns the oil now floating on the Atlantic Ocean.

Recovery of cleanup costs could come from two voluntary industry funds or compacts. One, the Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution (TOVALOP), is designed to encourage tanker owners to cleanup after themselves.

The other compact or liability fund, the Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL), is designed as a supplement to the tanker owners fund.

In order to recover even cleanup costs from thhe CRISTAL funds, however, true ownership of the cargo of 180,000 barrels of residual fuel oil must be determined. There is confusion as to the owners of the Thebes Shipping Co., Inc. which owns the Argo Merchant, but there is also uncertainty as to the identity of the owner of the oil.

For example, the oil was intended for delivery to Northeast Petroleum of Chelsea, but Northeast President John Kaneb said the company was not to take possession of the oil until its delivery in Salem Harbor. Northeast purchased the heavy fuel oil through Holborn Limited, a wholly owned subsidiary of Coastal States Gas Corp. of Houston.

Yesterday Bob Wells of Coastal States said the company was simply a broker and likewise was not to have possession technically of the oil until it reached Salem.

Wells said Coastal States, which was investigated by the Federal Energy Administration last year for marketing residual oil at more than $23 per barrel in spot loads during the Arab oil embargo, bought the fuel from another broker. from another broker.

He said the broker was Cibro Sales Corp., a subsidiary of a New York fuel terminal company, Cirillo Brothers. Spokesmen for Cirillo Brothers could not be reached to determine where the oil came from and who owned it when it was in transit in the Argo Merchant.

Since the original loading point of the Argo Merchant was Venezuela, the oil must originate somewhere along the line with the national oil company of Venezuela.

Both funds involve only liability for the cost of cleaning up damage immediately resulting from spills.

"If you can see and define the hurt, you can collect for it," Bursley said of the two funds. Possible damage over a period of years to fishing resources on the valuable Georges Bank would not be covered by the funds or by two other international treaties, one of which the United States is not a party to and the other of which has not been ratified by the necessary number of countries.

[From the Boston Globe, Dec. 23, 1976]

TANKER HEARING CLOSED TO PUBLIC

U.S. Magistrate Lawrence A. Cohen reversed himself yesterday and ruled that the press and public cannot attend the interrogation under oath of eight crew members of the Argo Merchant. The depositions began yesterday with the questioning of the ship's master, George Papadopoulos.

In a 6-page opinion, Cohen cited the Federal Rules of Civil Procedure and local court rules, which require transcripts of depositions to be sealed and opened for inspection only by parties to the suit.

Permitting depositions to be public would amount to an "end run" around the rules, he said.

He said he acted too hastily Tuesday in saying the deposition would be public if Boston Atty. Michael Latti agreed.

Latti, who is conducting the depositions in his office, represents a group of Cape Code fishermen who have filed $60 million damage suits against the shipowner and the master.

Cohen cited a Federal case in California in which the Sunday Times of London sued, claiming a right to attend depositions that were taken in California in the aftermath of a 1974 plane crash in Paris that killed 350 persons. In that case the California Federal judge ruled that the depositions were not a trial and that the public had no right to be present.

Cohen said his ruling "does not purport to decide any issue concerning the conflict between the public's right to know under the First Amendment vis-a-vis the right to a fair trial. Representatives of the press and media were not before this court as parties or in any other capacity, and the issue was not presented in that context. Thus, the First Amendment issue is one which must be pressed—if at all—in another forum independent of the issues presented to this court.

Cohen limited attendance at the depositions to lawyers for the parties and for the Federal and State Governments. The Federal Government is not a party. The fact that the spill occurred outside the 12-mile contiguous zone and has drifted even father from land has created jurisdictional problems for Federal involvement in a damage suit. Depositions are sometimes taken when it is difficult to find a witness at the time of trial.

Depositions are mechanisms used by lawyers to gather information for trial and refine the issues. The testimony, which is given under oath, does not become evidence until and if it is presented at the trial.

A notary public, usually the stenographer, presides. Witnesses are subject to cross examination. Disputes are resolved by appeal to a judge, in this case Cohen.

[From the Boston Globe, Dec. 23, 1976]

DUKAKIS ASKS FORD FOR SPILL AID

(By Jerry Ackerman and Ken O. Botwright, Globe staff)

Gov. Michael S. Dukakis yesterday asked President Ford for emergency relief to aid fishermen, tourist resort operators and others who might suffer economic hardship from the Liberian tanker oil spill. A top Federal pollution expert warned that resort areas are as likely to be damaged as fishing grounds because it appears improbable that the 7.5 million gallon blob that oozed from the Argo Merchant will break up soon. The oil probably will ultimately wash ashore in the form of tar balls, according to Kenneth Biglane of the Environmental Protection Agency.

The governor's press secretary, Alan Raymond, said state environmentalists and economists estimated the spill could result in a loss of $83 million to Bay State fishermen if it pollutes the rich Georges Bank fishing ground. The tourist industry on Cape Cod, Nantucket and Martha's Vineyard could lose $75 million if the oil should foul beaches.

Dukakis, scheduled to testify last night at a Boston hearing on the tanker disaster under the chairman from Massachusetts, Sen. Edward M. Kennedy, specifically asked Ford to declare a state of emergency in all areas affected by the oil spill. He said the commonwealth's resources are insufficient to deal with the massive spill and he requested that Federal agencies be placed on alert to aid the state.

The governor made a separate request that the Federal Small Business Administration be instructed to provide low-interest, small business loans for any fisherman who might need them.

A message from President Ford was brought to the hearing by Russell Train, director of the Environmental Protection Agency, and Massachusetts Sen. Edward Brooke.

Train said the President, in Vail, Colo., expressed his concern about the "serious threats to the New England shoreline and fishing industry posed by the oil spill." Mr. Ford also said he had directed appropriate Federal agencies to do "all possible . . . to contain damage and provide assistance to the community."

Brooke said the President originally had the impression that Dukakis wanted a natural disaster declaration, entitling Massachusetts to emergency funds under 1974 legislation. The senator said he, Kennedy, and U.S. Rep. Gerry Studds (D-Mass.) had requested such a declaration.

But the President hasn't acted on the disaster declaration because "at this time, no one knows what the extent of the disaster will be." However, "if it turns out that it has been declared a disaster area, then that decision will be made."

Dukakis's press secretary, Raymond, said the governor made a last-minute decision not to press for a natural disaster declaration. Instead, he requested a declaration of a state of emergency "because that would kick off more immediate relief, such as small business loans for our fishermen who are already suffering."

At the moment, emergency funds are available, and if further money is needed "special legislation will be filed," Brooke continued.

A similar opinion on the environmental and economic impact of the spill were expressed by Dr. Robert White, director of the National Oceanographic and Atmospheric Administration, and Assistant Secretary of Commerce and Development John Eden, who heads the Economic Development Administration.

White said scientists were taking water samples in a bid to discover the gravity of the oil spill and intended to examine the oil's effects on the seabed. "We just don't know the extent of the damage yet," he stated.

Eden said he had come to Massachusetts "to assess the damage to the fishing industry and design a program of aid."

[From the Boston Globe, Dec. 23, 1976]

THE UNPREDICTABLE AND UNCONTROLLABLE OIL SPILL

(By Jerry Ackerman, Globe staff)

The Argo Merchant oil spill could be devastating to fish, wildlife and beaches—if not permanently, for a long, long time. But, the sun, wind and choppy seas could make the offending oil all but go away—at least dissipate it in the water and air to a point where it will barely bother anyone or anything. Aside from these possibilities is the fact that there is almost nothing humans can do to control the effects of a spill.

The question of spills at sea has been crucial in the continuing controversy over whether the North Atlantic, the Gulf of Alaska, and other 'virgin' ocean areas should be opened to oil exploration.

There are cases to be argued on both sides.

Perhaps the most studied oil spill on the East Coast was the loss of 588,000 gallons of diesel oil when a barge was grounded at Woods Hole in 1969.

Thousands of clams and other shellfish died. Their beds have never recovered. The oil remains on the bottom, now permeating 12 inches into the sand and mud and showing no sign of leaving.

That also was the year of the Santa Barbara channel oil well blowout and the effects are still remembered.

But seven years later, nearly all the spilled oil is gone at Santa Barbara. Some was scoured up by human effort. Most was broken up by natural forces.

It is not completely gone, of course—a lot evaporated and now is in the air we breathe, much of the remainder was broken into minute particles by bacteria or the action of the sea. However, some remains either drifting around the Pacific or somewhere at the bottom.

Today, there is no predicting the harm the Argo Merchant's 7.5 million gallons of oil will do.

Scientists tracking the spill yesterday expressed surprise that the 100-mile-long spill was not moving with the wind, but rather was being moved by ocean currents, about which little is known.

The heavy, almost pasty residual oil that was lost this week is more troublesome than either the diesel oil dumped at Woods Hole or the crude oil of Santa Barbara. Residual oil comes almost literally from the "bottom of the tank" at the refinery. It doesn't evaporate quickly, as do fuel oils, gasoline and the larger portion of crude oil.

From now through the first of the year, the area south and east of Nantucket will become a giant laboratory for oceanographers who admit that they just don't know enough about oil's behavior at sea.

They don't know whether the oil will keep floating, or sink to depths where fish eggs are waiting to hatch. They don't know if this particular cone-shaped oil blob, 100 miles long and nearly 20 miles across at its widest point will hang together through the winter or start breaking into tar balls that could float onto beaches next summer.

The one sure thing is that the spill couldn't be controlled.

When Federal hearings were conducted in Boston earlier this month on the question of leasing parts of the North Atlantic for oil exploration, one witness was O. J. Shirley, a spokesman for the oil industry on environmental matters in New England.

Shirley, a middle-level executive with Shell Oil, declared that the oil industry now is more vigilant at policing its own grounds.

A consortium of companies plans to put an array of oil-spill-cleanup hardware, at Davisville, R.I. to cope with pollution during exploration.

A list of that equipment, revealed it consisted of two skimmer units with a total capacity of less than 23,000 gallons of oil, and 3500 feet of flotation boom to encircle a spill.

Under questioning, Shirley acknowledged that such booms have limited effectiveness in seas up to 6 feet—about the calmest, say many mariners, that can be expected at Georges Bank.

Yesterday, as the Argo Merchant sank and the liver-like lump of oil floated further eastward, seas were in the range of 15 to 20 feet, a rough voyage for the scientists and government salvage experts sailing nearby.

And as a matter of practicality, there isn't enough flotation boom in the world to encircle a spill the size of the Argo Merchant's cargo.

[From the Boston Globe, Dec. 24, 1976]

PRESS TO BE ALLOWED AT QUIZ ON TANKER

(By William F. Doherty, Globe staff)

U.S. District Judge Joseph L. Tauro ruled yesterday that members of the press may attend the interrogation of the master and crew members of the Argo Merchant.

The order overturned a ruling by Magistrate Lawrence Cohen closing the proceedings to the public and news media.

The interrogation under oath, called depositions, began Wednesday with testimony from the master, George Papadopoulos. He will still be on the witness stand when the depositions resume Monday.

Tauro's order, dictated from Maine where he is vacationing, followed within hours a motion by the Boston Globe to open the proceedings. The Globe cited the free press provisions of the First Amendment. Tauro said that the procedural court rules cited by Magistrate Cohen in closing the depositions do not bar the press when the lawyers in the case do not object to the presence of the press. Atty. Michael B. Latti, who is conducting the depositions, in his office on commercial wharf, did not object to press attendance. Latti represents a group of Cape Cod fishermen that has filed a $60 million damage suit against the ship owner and master.

A New York lawyer, Joseph C. Smith did object to open proceedings, but his objection was rejected because he has not entered a formal appearance in the case.

Smith represents the ship owner and master in a New York suit in which the owner seeks to limit its liability. However, in an apparent challenge to the jurisdiction of the Federal Court here Smith has declined to file a formal appearance as counsel for the defendants in the Boston case. Technically the defendants in the Boston case have no lawyers as yet. They apparently feel the case should be tried in New York instead of Boston.

Tauro said he will hear objections to his order from any lawyer who enters a formal appearance in the case. Tauro said news media may obtain from the court stenographer transcripts of testimony during the two days the proceedings were closed. The stenographer, Bob Lange, recording the deposition sessions said yesterday it would be at least a week to 10 days before he could type up the transcripts for public scrutiny.

In view of his order allowing reporters to attend the depositions. Tauro said "It is unnecessary for me to rule at this time on the Boston Globe's petition to intervene." In its motion the Globe said that unless one of its reporters could attend the deposition, "It is highly unlikely . . . it will ever have the opportunity to see, hear and observe testimony of those who were in control" of the tanker when it went aground.

The Globe said it and "the public desire as much information as they possibly can acquire both in order to understand what has happened and in order to intelligently consider measures which might be proposed to prevent similar situations from happening in the future. It is precisely that thirst for information which the First Amendment is designed to satisfy."

The Globe motion filed by Attys. Thomas H. Walsh, Jr., and James F. McHugh observed that:

"At the present time, behind closed doors the most critical information concerning the events which led to the grounding of the Argo Merchant is being disseminated—pursuant to a request—with the force of law.

"It is being disseminated for the first and probably for the only time and at a time when the events are most fresh in the minds of the witnesses. The events so disseminated are events of absolutely extraordinarily public importance, concern and interest."

In other court developments yesterday Magistrate Cohen scheduled a hearing Monday on a request by Atty. Gen. Bellotti's office to conduct its own depositions of the master and crew.

Bellotti, in his petition said the state needed to gather information for a damage suit it plans to file. He said the spill has threatened "imminent large scale damage" to the state's public coastal lands, coastal waters, marine and wildlife and other natural resources.

The state's suit cannot be filed now, Bellotti said, because the extent of the damage is not yet known. He anticipated a suit against the ship owner, Thebes Shipping Co. of Monrovia, Liberia, and the master for "culpable maintenance and operation of the ship," resulting in the oil spill.

[From the Boston Globe, Dec. 24, 1976]

GEORGES BANK THREAT OVER, SCIENTISTS SAY

(By Paul Langner, Globe staff)

Oceanographers and Coast Guard experts yesterday said computer projections of the probable flow of oil from the Liberian tanker Argo Merchant indicate the danger to the winter fishing grounds in Georges Bank has virtually passed.

The spill from the tanker, which ran aground on Nantucket Shoals Dec. 15, now covers about 2,000 square miles, Coast Guard officials said. But the northernmost edge of the contaminated area is 35 miles south of the prime fishing grounds.

Little Georges Bank—a subsidiary fishing area to the southwest of the prime area—is covered with the sheen of Number 6 residual oil, and to the west and east of Little Georges Bank are denser patches of oil that threaten the fishing and breeding grounds of scallops and yellowtail flounder.

But the denser patches had not reached those breeding grounds as of yesterday's last surveillance flight by a Coast Guard oceanographic team.

The prevailing winds were out of the west yesterday and are expected to shift to the northwest early today, pushing the oil further to the east and the southeast—further away from the prime fishing grounds.

The chance of the oil's hitting the U.S. mainland is about 1 in 20, according to Dr. Richard Smith, an environmental scientist at the Geological Survey Center in Reston, Va., who based his projection on statistical analyses of actual observations and computer simulations of hypothetical oil spill movements.

The Argo Merchant is now broken into three parts. Members of the Coast Guard's Atlantic Strike Team boarded the bow section of the vessel shortly before noon, inspected the forward oil tanks and found them empty. They left the tanks open and opened other hatches and manholes.

"We hope she'll sink right there," said a Coast Guard spokesman. The vessel thus would join the hundreds of other wrecks that litter Nantucket Shoals, becoming a menace to navigation of small craft. With no immediate danger expected to nearby shores and fishing areas, the Coast Guard suspended operations on the Argo Merchant.

Capt. Lynn Hein, the on-scene coordinator for the salvage effort, said that small amounts of remaining oil continue to leak out at a rate of about 100 gallons an hour, but that for all practical purposes the tanks were empty. "I have released the Army personnel that have been standing by in case they were needed to help in the cleanup and they have gone back to Ft. Devens where they will be on 2-hour standby," Hein said.

On Nantucket, however, an eight-man Coast Guard team and private contractors were standing by just in case because, Hein said, it would take too long to stage men and equipment on the island.

Meanwhile, Navy divers and the Coast Guard cutter Evergreen were continuing to inspect and sample water and bottom matter in the spill area to determine how the oil was behaving.

By late yesterday, neither divers nor experts taking the samples had detected any oil on the bottom. Some oil globules were found suspended in the water as deep as 21 ft. Most of the oil had either stayed on the surface or penetrated from three to six feet down.

Dr. Jan Prager, chief of technical assistance at the Environmental Protection Agency's lab at Narragansett, R.I., said the laboratory has a research vessel in the area conducting tests to ascertain the effect of oil on sea life, and "to find out what's happening under the surface."

Dr. Prager said 160-foot research vessel Delaware II has been probing the periphery of the spill area, picking up samples of sea life.

"They have already taken aboard specimens of hake, flounder, sand crabs, scallops, lobsters, and skates. I understand they have not detected any readily observable problems with these," Dr. Prager said.

Also being taken aboard Delaware II are specimens of zooplankton, larval fish, and fish eggs which will be frozen and shipped back to the laboratory after the vessel docks this morning in Sandy Hook, N.J.

"We are looking for petroleum hydrocarbons in the plankton to determine if the material is being passed through," Dr. Prager said.

At its furthest extent plotted, the slick has reached 90 miles due east of the tanker and the prevailing winds out of the west-northwest were drifting past the southern reaches of Georges Bank.

Asked if the oil might ever come ashore, Capt. Hein said that "it might come ashore but which shore I don't know, maybe the British Isles. I am hedging my bets. At this time, it does not look as if it is going to come ashore, but one has to keep in mind always Murphy's Law." (Murphy's Law states that anything that can go wrong, will go wrong.)

Smith said in a statement released in Reston, Va., that "there is less than a 5 percent chance that the North Atlantic oil spill . . . will reach the New England coast within the next 30 days," Smith said based on current wind patterns and a computer model that analyzes oil spill risk, "the main plume of the oil spill is most likely to continue moving easterly, farther away from the New England coast.

The oil spill risk analysis methodology is "quite new and still undergoing testing and refining," Smith said. "We are encouraged, however, that the movement of the Argo Merchant oil spill predicted so far by our computer model has corresponded quite well with the actual trajectory the spill has taken."

A team of scientists at Massachusetts Institute of Technology pioneered in the development of the oil spill risk analysis. The team was led by J. W. Devanney 3d and Robert J. Stewart of the Ocean Engineering Dept.

Earlier this year, in an article he wrote for Technology Review, Stewart said the cold northwesterly winds dubbed the "Montreal Express" dominate the winter weather of New England. "In the winter, this wind pattern can be counted on to drive oil spills from the Georges Bank region well out into the Atlantic where they can be carried away by the Gulf Stream."

The predictions are valid even though, as Stewart said, "these estimates are not without their uncertainties. We still do not understand how the waves passing underneath an oil slick, the wind blowing over it, and the gross motions of the underlying water combine to move oil on the surface of the sea . . . although progress is constantly being made."

Lt. Cmdr. C. W. Morgan, of the Coast Guard's Oceanographic Unit at the Washington headquarters, said that while no oil had been found on the bottom, all samples were being analyzed at the Coast Guard's research center in Groton, Ct., and that the first results would not be out for two days.

Lt. Cmdr. Barry Chambers, the commanding officer of the special 20-man strike team, said that after climbing into the tanks and storage spaces still above water in the bow section, he had seen no significant amounts of oil.

He and two other men, Bosun's Mate James Klineselter and Mechanic Chuck McKnight were lowered from a helicopter yesterday noon onto the forecastle deck that was then sloping at about 60 degrees, and listing 20 degrees. It was like climbing a mountain of steel covered with oil, Chambers said. They emerged covered with oil from head to foot. They had opened the tank tops on all three forward tanks and had opened other hatches and manholes.

"Right now the seas are pretty calm," Chambers said, "but as soon as we get some weather the bow section will flood and sink. Then we'll give her a few days to settle and when we're sure she is stable we'll send divers down."

Seas which were about 3 to 4 feet yesterday, under 15 knot winds, were expected to increase as winds are predicted to increase to 25 knots today.

With the calming of the seas, the slick became more solid than it had been in the past week of turbulent waters. The area for more than a mile radius around the tanker was almost a solid slick with occasional heavy patches of concentrated oil to be seen.

Chambers said that it would be about 2 weeks before the oil would stop coming out from the tanker at a continuous stream as it does now, even though the rate is relatively small.

"There are pockets in the ship, odd, abstract tears, ripped sections where oil has been trapped and it will keep coming out for awhile," he said.

Lt. Cmdr. Morgan, asked about the effect of currents in the oil's drift, explained that oil responded quickly to the wind and that its drift depended more on wind than tides or currents. There was a chance, he said, that some of it might be caught by a meander, or diversion, of the Gulfstream that comes this far north and west in the winter and that some of the oil might then travel with the Gulfstream northeastward.

This, however, is beyond the Continental shelf and therefore beyond the prime fishing grounds.

Chambers said that he did not expect the oil to settle to the bottom, basing their estimates on previous work with spills of number six oil.

He also discounted the chance of undersea currents bringing the oil back to U.S shores in the spring. "If any does, I don't think you'll ever find it," he said.

As spills go, he said, No. 6 was not as bad as other kinds of oil would have been. The worst possible would be No. 2 oil which is home heating oil and diesel fuel. The second worst, he said, are some kinds of crude oil. These disperse more finely through the water and if animals come in contact with it, they are more seriously affected.

In other developments yesterday:

Congressional sources said the Liberian government would convene a formal board of inquiry to look into the accident and reports the vessel may have been grounded intentionally.

The inquiry, the sources said, might be held in public in New York City around mid-February, after Liberian officials have received a confidential staff report including a computer study of stresses in the hull of the Argo Merchant.

Gov. Michael S. Dukakis wrote to Pres. Gerald Ford through the Federal Disaster Assistance Administration office in Boston to ask that the commonwealth's request for a declaration of an emergency be kept open "so that we can provide you with more detailed information as it becomes available." Dukakis said, "While the effect of an oil spill is less immediately visible than that of a land-based disaster, we fear the damage will be long-lasting and pervasive."

Bruce Gullion, state commissioner of fisheries and wildlife, said the Federal monitoring of surface movements of the oil "is not enough" and added that the state is considering every-other-day checks for subsurface oil at various depths in Nantucket Sound and Buzzards Bay. "We do not know what the flow will be," Gullion said. "Will it be surface? Will it be bottom? Where will it come up? And when? We don't know if we can keep the oil out (of harbors and estuaries) . . . but if this stuff is beginning to move . . . we will try to buffer the shellfish beds."

—Alan Peterson, state director of Marine Fisheries, said fish now in stores "contain no evidence of any contamination . . . and fishermen are avoiding the area impacted by the oil spill . . . so fish products in the immediate future pose absolutely no danger . . ."

[From the Boston Globe, Dec. 25, 1976]

Spill Keeps Drifting Seaward—Just as Experts Predicted

COMPUTERS USED TO TELL WHERE SLICK IS HEADED

Scientists and oil spill experts hoping to predict what will happen to the huge blanket of seaborne oil from the Argo Merchant have asked their number-munching computers for predictions—and so far the machines have been right on.

"We keep updating our computer model," said Dr. Richard A. Smith, a hydrologist with the U.S. Geological Survey in Virginia. "We've been comparing our predictions from the model with the observed locations of the spill.

"So far, they've been very good, surprisingly good. It suggests that our model is quite good and we're encouraged by the results we've seen so far," Smith said in a telephone interview.

The computer model—which uses masses of statistics about wind speed and direction, surface currents in the sea, the rate of oil flow from the wrecked Argo Merchant, and the size of the oil slick forecasts how far, how fast and in what directions the oil will spread.

"Our feeling now," Smith said, "is that there is only a small probability, less than 5 percent, that the oil will come ashore anytime soon, at least within the next month, in New England. What will happen farther in the future can't be predicted accurately, he said.

"As it moves farther east there is some possibility that some rather well-weathered oil or tar balls will end up in Nova Scotia, but that probability is still small."

This ability to forecast where the oil might—or might not—end up is the result of several years of work by a wide range of scientists, including Smith and a team of ocean engineering specialists at Massachusetts Institute of Technology.

In a discussion of efforts to predict oil spill movements, Dr. Robert J. Stewart, in MIT's Technology Review magazine, warned that such estimates of oil behavior at sea "are not without their uncertainties."

"We still do not understand," for example, he said, "how the waves passing underneath an oil slick, the wind blowing over it, and the gross motions of the underlying water combine to move oil on the surface of the sea."

Such ignorance about the behavior of oil afloat at sea, he added, exists because scientists have only been interested in the subject since the Torrey Canyon oil spill off the coast of England in 1967. Since then, too, only some 20 tests have been conducted offshore, and most of these were aimed at learning how to detect spilled oil.

In a large study done recently to help assess what might happen to oil spilled from drilling rigs in the Georges Bank area, Stewart said computers were used to "track" the spread of 200 hypothetical oil spills. The results:

"In general, the spill trajectory behavior was highly seasonal on the East Coast due to the pronounced change in the surface wind patterns between winter and summer.

"This is most evident in New England where winter weather is dominated by the 'Montreal Express,' the cold northwesterly blast of cold air that frequently chills the region."

In summer, however, the weather is characterized by the strong Bermuda high pressure center, which tends to send humid tropical air masses occasionally as far north as Boston.

"In the winter," Stewart said, "this wind pattern can be counted on to drive oil spills from the Georges Bank region well out into the Atlantic, where they can be carried away by the Gulf Stream."

Smith, at U.S. Geological Survey headquarters in Virginia, said that the information on winds and currents that helps make up the computer model of the Argo Merchant oil spill "is based on the behavior of previous oil spills, which occurred under generally similar circumstances."

One of the most important variable components of the model, he explained, is the wind, and there is no firm agreement yet, even among experts, on how large a role the wind plays in oil movement.

The best guess so far, he said, is that surface oil at sea picks up about 3 percent of the wind's velocity.

"It turns out that—on the basis of at least one theoretical argument—the wind velocity (contribution) ought to be about 3 percent. This has seemed to work for most oil spills in the past, but on this one we've been using 3.4 percent."

The 3.4 percent figure appears to be more reliable based on observations of the Argo Merchant spill so far, he said.

Smith noted, however, that "the winds are quite variable," making it difficult to predict where an oil slick will go in the future. "Winds can't be reliably predicted for more than short periods of time," he said.

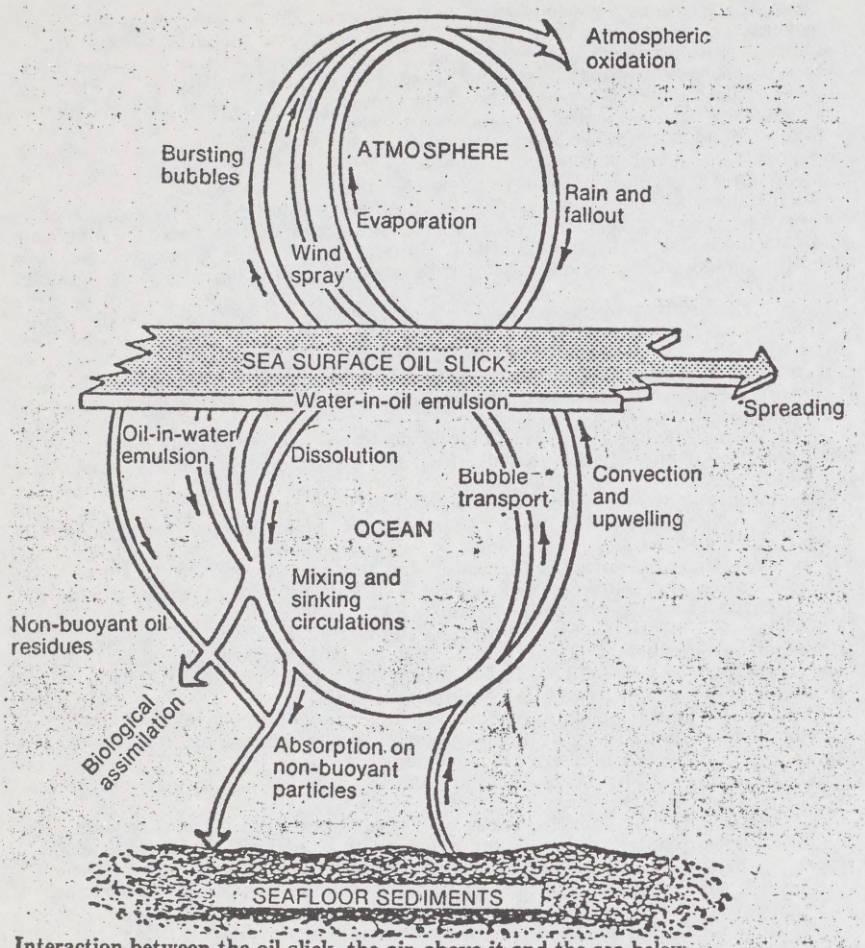
Because of the variability of the wind, he said, "what one does is take the records of past wind speeds and directions, then summarize the variability of the wind in terms of velocity and direction to say how long the wind can be expected to blow at what speed."

Basically, Smith said, "we've been trying to do two things. First is to make predictions of the movement of oil from the Argo Merchant in probalistic terms—where it will go, how soon."

Second, he said, "we've been taking actual wind observations, every three hours, since the spill occurred. We have put this series of wind speeds and directions into our computer model directly, and we can get a prediction of what the oil slick ought to look like now."

Complicating the effort to predict the spill's movement is the fact that much of the heavy No. 6 residual oil from the Argo Merchant has sunk beneath the surface, where its location is difficult to chart.

Nonetheless, said Smith, the results have been "very good, surprisingly good. It suggests that the model is quite good."



Interaction between the oil slick, the air above it and the sea below.

COAST GUARD PRACTICES IGNITING OCEAN OIL SLICK

(By Robert Cooke, Globe staff)

New England's persistent winter winds continued pushing a 7.6 million-gallon batch of spilled oil farther out to sea yesterday as the U.S. Coast Guard started new oil-control experiments in the open ocean area.

The winds, which have generally whistled down out of the northwest from Canada since the Liberian tanker Argo Merchant ran aground on Dec. 15, had turned around briefly early in the day, slowing the oil drift, but the return to northwest winds was expected to keep pushing the thick oil away from land.

"There's nothing we can do" about the huge oil slick now, said Coast Guard spokesman John Bablitch, but "with the prevailing winds it won't be coming ashore in the United States." A board of inquiry into the marine disaster was appointed yesterday by the Liberian government.

Bablitch said the wind shifted yesterday, coming again from the northwest, pushing the splotchy blanket of oil toward the southeast, farther away from one of the world's richest, most productive fishing grounds, Georges Bank.

During operations yesterday, he said, Coast Guard officers, along with representatives of the U.S. Environmental Protection Agency and the U.S. Army,

experimented with a compound that may eventually provide a way to burn up such huge amounts of heavy oil on the sea.

"We ran an experiment this morning with a material that can burn oil off the water," Bablitch explained. "The experiment did not use large amounts to burn oil off because it's still in the experimental stage. At a later date we may be going out and dropping it on patches of oil. The experiment this morning was conducted to devise a time-delay ignition device that will be effective and provide for safe ignition of the material. It was successful."

The material was described as a powdery substance, a silica compound called Tullanox-500. It was called a superhydrophobic fumed silica, and is manufactured by Tulco Inc., of North Billerica.

Bablitch emphasized that the experiment was not an attempt to clean up the Argo Merchant oil spill by burning. "There was no connection. We don't want to use this stuff to burn up the oil out there. We have to test it more. But we may go out later to look for patches of oil to try it on. We need patches 10 to 20 feet in diameter."

He said the material had been used in Sweden to burn up oil leaking from a burning ship.

Officers said the bow of the dismembered ship is still afloat 27 miles southeast of Nantucket Island. They said it is expected to sink when the weather turns worse.

Asked if the remains of the ship might be destroyed as a hazard to navigation, Bablitch said: "Probably not, but wreckage buoys may be placed there if necessary." The Coast Guard cutter Vigilant was standing by the remains of the oil tanker.

Capt. Lynn Hein, overseeing the Coast Guard's effort to control pollution from the wreck, noted yesterday that air surveys of the oil spill—which now covers 3000 square miles—had failed to turn up any major patches of heavy oil. This suggested that the blanket of oil is breaking up rapidly.

Sen. Claiborne Pell, made an inspection flight over the oil spill area yesterday and commented: "From the viewpoint of our community and our fishermen, thank God it's broken up." In Washington, Capt. Clarence R. Halberg, chief counsel for the Coast Guard, commented that even under the best circumstances such oil spills at sea are impossible to prevent. Even if every tanker at sea were superbly built, manned by the most skillful crews and best navigators, some would still run aground, he said.

As for the impact of the Argo Merchant oil spill on current efforts to begin drilling for oil on Georges Bank, most New England officials—including governors—who favored oil exploration still favor oil exploration.

"I don't think this is going to affect, in general, our attitudes or policies about offshore oil development," said Alan Raymond, press secretary for Massachusetts Gov. Michael Dukakis.

Rhode Island Gov. Philip W. Noel commented: "If it has an effect at all, it should be to create an awareness among those in the northeast coastal area that we're far better off using our own people and our own technology in order to produce petroleum products in an environmentally safe way. Some of the equipment and technology they use is vastly inferior to the technology we've developed in this country.

[From the Boston Globe, Dec. 27, 1976]

Hearing on Wreck of Tanker Shifting to New York Today

(By William B. Hamilton, Globe staff)

Georgios Papadopoulos, master of the tanker Argo Merchant, is scheduled to appear in a Federal courtroom in New York today to resume his testimony on the circumstances surrounding the Liberian-registered ship's grounding off Nantucket early in the morning of Dec. 15.

Papadopoulos will continue with a deposition he began last week in Boston but which a Federal judge subsequently said should be taken in New York in order to avoid "a state of confusion" resulting from the number of suits against the Argo Merchant's owner, the Thebes Shipping Co. of Monrovia, Liberia.

All of the depositions concerning the ship's grounding will be presided over by U.S. Magistrate Sol Schreiber in the U.S. courthouse in Foley Square. The proceedings will be open to the public. In addition to Papadopoulos, 12 members of the crew are scheduled to appear as witnesses.

Lawyers for both Thebes Shipping Co. and for a group of Cape Cod fishermen who are suing the ship's owners for $60 million will be allowed to question Papadopoulos. But the fishermen's lawyer, Michael B. Latti, said yesterday that he will attempt to have the proceedings brought back to Boston for "legal reasons" which he declined to disclose.

U.S. District Judge Thomas P. Griesa ordered that the depositions be taken in New York because of a request by Thebes Shipping Co. for a limitation of liability. Under admiralty law, a limitation proceeding is used to consolidate all the claims against a company after an accident or other incident in which damages have been incurred.

"You can't fight a suit in New York, another one in Boston and another one in Portland, Maine," Joseph C. Smith, the lawyer representing Thebes, said yesterday. "This is an expeditious way of settling all the claimants in one jurisdiction."

Smith added that the suits which resulted from any major marine disasters—including the sinking of the Titanic and the collision of the Andrea Dorea and Stockholm—have been dealt with in a similar manner.

The action in Judge Griesa's court against Thebes Shipping Co. was initiated by the Northeast Petroleum and Shipping Corp., Ltd. and Continental Insurance on the day after the Argo Merchant went aground.

Although legally it is still uncertain who owns the cargo of 7.6 million gallons of No. 6 oil that the Argo Merchant spilled into the Atlantic, it was being delivered to Northeast Petroleum at the time the tanker ran aground. It was Continental which insured the oil for Thebes Shipping Co. for a total of $2,375,000.

According to Continental's lawyer, Douglas A. Jacobsen, the insurance company will have to reimburse whoever it is finally decided owns the oil—Northeast; Holborn Limited, a wholly-owned subsidiary of Coastal States Gas Corp. of Houston which sold the oil to Northeast; or Cibro Sales Corp., a New York broker which sold the oil to Holborn.

Right now, Jacobsen said yesterday, the insurance company is seeking to establish whether the cargo of oil was lost because of negligence. He said that to establish this under admiralty law it will have to be shown that the Argo Merchant was inadequately equipped by its owners. If the cargo was lost only because of a navigational error, he said, it will be difficult for Continental to collect any damages.

Smith, the lawyer for Thebes Shipping Co., said that under the limitation proceedings, persons seeking damages against the company will have about 6 months to enter their claims. He said he expects fishermen from states besides Massachusetts to enter the case. The earliest any restitution can be awarded will be about 2 years from now, he estimated.

Meanwhile, North Atlantic winds once again began blowing from the northwest yesterday afternoon, ending for now any possibility that the oil leaked from the Argo Merchant would head back to land.

A Coast Guard spokesman said that before shifting to the northwest at noon, southeast winds had blown the slick to within 19 miles of the southeast tip of Nantucket—8 miles closer than it had been on Saturday.

The precise parameters of the slick, the spokesman added, are unclear because Coast Guard planes both yesterday and Saturday weren't able to fly over the full area in which oil has been sighted. But the latest calculations put the farthest tip of the slick about 90 miles east of the Argo Merchant wreck.

In an attempt to chart the currents, scientists from the Coast Guard and the National Oceanic and Atmosphere Administration yesterday dropped thousands of orange plastic cards in the seas between the Argo Merchant and Nantucket.

Anyone finding a card on a Cape Cod, Martha's Vineyard or Nantucket beach has been asked to note its location and then contact scientists who are staying at the Holiday Inn in Hyannis. A Coast Guard spokesman said the finder can keep the card and noted that the 2½ x 3¼ inch pieces of plastic make "excellent" key chains.

Coast Guard officials are not sure how much oil remains on board the Argo Merchant, though they believe a small amount continues to leak from the tanker's three sections, which are resting on a shoal 27 miles southeast of Nantucket. Only the bow is still above water.

As soon as the bow section of the ship settles more on the sandy shoals, a spokesman said, divers will examine the section to look for any remaining pockets of oil. Any plans for salvaging the sections have been abandoned, and the three sections of the Argo Merchant are likely to remain where they are now.

The effect of the oil on birds and marine life is still not certain. Nor is it clear

how much oil has sunk o the ocean floor. Navy divers last week could fluid no trace of oil at a depth of 140 feet in a location east of the Argo Merchant. Bottom samples taken in five locations did, in one instance, have a trace of oil, but scientists believe the oil may have come from another source.

Officials of the state Department of Environmental Quality Engineering are expected to begin testing samples today of fish brought in at Chatham and New Bedford for effects of the oil.

"We don't expect any problems," David Standley, the department's commissioner, said yesterday.

Coast Guard planes, in their daily flights over the slick, have reported sighting dead birds and sea gulls with oil on their bodies.

[From the Boston Globe, Dec. 31, 1976]

JUDGE ORDERS ARGO CAPTAIN TO REMAIN IN NEW YORK CITY

(By Paul Langner, Globe staff)

Contradicting the orders of a Boston Federal judge, a U.S. judge here yesterday ordered Georgios Papadopoulos, captain of the Argo Merchant, to remain in New York while depositions are being taken on the tanker's grounding on Nantucket Shoals Dec. 15.

The order, issued by Judge Thomas P. Griesa, conflicted with an earlier order issued in Boston by U.S. District Judge, Joseph Tauro requiring Papadopoulos to testify in Boston Jan. 3.

Tauro issued his order Wednesday, on a motion filed by Massachusetts fishermen who are attempting to sue the Argo Merchant's owners for damage done to fish and their equipment by the 7.5 million gallons of heavy No. 6 residual fuel oil that spilled from the tanker when it went aground. The fishermen are being represented by Atty. Michael Latti.

During the same hearing in Federal Court here, Judge Griesa also denied Latti's motion to move to Boston the taking of depositions on the grounding. The depositions have been taken here for the past week. He also denied Latti's motion to exclude the Massachusetts fisherman from his order of Dec. 20 saying there was no reason the fishermen couldn't join the current limitation proceedings in New York.

The proceedings here involve a struggle between Continental Insurance Co., which insured the Argo Merchant's $2.3 million cargo, the shipowners, who wish to have their liability limited or to be absolved of responsibility altogether.

Judge Griesa told Latti that the Massachusetts fishermen could join in the preceedings against the owners. Thebes Shipping Company, of Monrovia, Liberia, could read the transcripts of depositions being taken here and then ask the crew any questions that had not already been answered.

Meanwhile, Northeast Petroleum Co. of Chelsea, to which the oil had been destined, said it no longer was a party to the court action. Atty. Douglas Jacobsen, who represents Continental Insurance, said that this changed nothing because the underwriters were the ones who brought the suit and were going ahead with it anyway.

There are four other parties that could possibly be called owners of the oil, "But," said Jacobsen, "they are all trying hard not to own the oil right now."

Judge Griesa deferred until Jan. 12 a ruling on two motions brought by both Latti and Assistant Atty. General Stephen Rosenfeld on behalf of the Commonwealth of Massachusetts to transfer the proceedings to Boston. Both parties were asked to present claims and supporting legal briefs. Massachusetts maintains it is acting on behalf of and in protection of the state's citizens and claims damage to seas, shores and wildlife. Damages' might eventually amount to $158 million, Rosenfeld said.

Yesterday's testimony brought out contradictions between the captain and the helmsman over which compass was being used before the grounding. The captain had stated in earlier testimony that the ship was on automatic steering in the daytime and on manual at night and that the helmsman was steering by the gyrocompass repeater until the gyro became erratic the night before the grounding.

Roach, however, said that he had been steering by magnetic compass ever since the ship drew abreast of Florida 4 days before the grounding. The captain had said that not until the night before the grounding had he resorted to the magnetic compass exclusively. However, there was no contradiction about what the course was.

Roach also shed some light on the mysterious erasure in the log book that occurred near the beginning of the voyage from Venezuela to Salem. Erasures are illegal, both the captain and First Mate Georgios Ypsilantis said there was an innocent explanation. His second mate, Anastasios Vasileikis, had had a quarrel with Roach, wanted him off his watch and had entered the fact in the log, only to erase it later.

Roach yesterday said that he had made it a practice to erase the blackboard on the bridge on which the current course was entered and to rewrite it because he found his penmanship superior to that of the Greek officer. "I wanted it right and proper," Roach explained. Roach also said that he never learned the second mate's name and always referred to him as Garcon.

Roach also gave a picture of the sea and the bridge at the time of grounding that contradicted the picture of calm drawn by the captain and the first mate. He said when the ship came to a gentle halt on the shoal, the officers dashed out onto the starboard bridgewing trying to see Nantucket Lightship and one of them yelled to him "hard aport," meaning that he was to put the rudder over hard to the left.

There was also some rushing about by the officers and subsequent attempts to get off the shoal by reversing the propeller, but to no avail, he said.

The lawyer for Thebes, Joseph Smith, yesterday introduced evidence on the gyrocompass that he said would show that the owners were diligent in maintaining it. He produced repair bills from an electronics firm in Port of Spain, Trinidad.

State Will Ask US to Monitor Spill

(By Anne Kirchheimer, Globe staff)

High-ranking state officials will confer next week in Washington with Cecil D. Andrus, President-elect Jimmy Carter's choice for Secretary of Interior, on several oil spill related issues.

Gov. Michael S. Dukakis and Environmental Affairs Secretary Evelyn Murphy have scheduled a meeting Tuesday with Andrus.

Possible Federal monitoring of the 7.5 million gallon oil spill left by the grounded Liberian tanker Argo Merchant off Nantucket shoals will be one of the topics discussed.

Murphy explained yesterday that she would ask the Federal Government to maintain a scientific watch on the oil spill to determine what long-range effects it may have on ecological systems in the area. She said that she was "optimistic" that the request would be granted.

Even before the recent oil spill, Dukakis and Murphy had plannd to arrange a meeting with the Carter appointee to discuss the need for further administrative regulations to oversee the Federal explorations for oil and natural gas on Georges Bank, including the use of pipelines to transport the oil ashore.

Murphy and Dukakis have been under pressure from environmental groups to demand formally that the Interior Department require use of pipelines, rather than tankers, to bring ashore any oil discovered on Georges Bank.

Oil companies maintain the cost of ocean-bottom pipelines precludes their use until it is determined if enough oil exists beneath Georges Bank to make construction economical. Until then, they would prefer to use tankers.

"If they feel that it is not economical to develop pipelines, then we feel they should not develop the (oil) field in the first place," said Douglas A. Foy of the Conservation Law Foundation in Boston, one of the groups seeking state action.

Both Foy's organization and the New England branch of the Sierra Club say they are prepared to press the point alone but they have wanted the state's endorsement. Reportedly, Dukakis has been unwilling to add his signature until the Carter administration is in office. Murphy's arrangement to meet with Andrus is regarded as a compromise effort which would avoid formal proceedings.

Meanwhile, the Coast Guard reported yesterday that the bow of the Liberian tanker Argo Merchant was beginning to move in a southeasterly direction. It moved about 400 to 500 yards in 48 hours.

Coast Guard officials will decide today whether they will fire holes into the ship's bow to sink it.

This morning, a Coast Guard aircraft will make a six hour surveillance of the area. U.S. Secretary of Transportation William Coleman, whose department has jurisdiction over the Coast Guard, intends to fly over the spill and then hold

a 9:45 a.m. press conference at Otis Air Force Base to discuss the situation before returning to Washington.

Coleman established a task force yesterday to study U.S. marine safety regulations intended to prevent oil spills.

The oil spill, which resulted when the 641-foot Liberian tanker ran aground on sandy shoals December 15, is moving in a southeasterly direction down the Gulf Stream approximately 30 miles southeast of Nantucket.

After a week of testing samples of haddock, haker, sea scallops and flounder, the State's Division of Marine Fisheries found no evidence of contamination from oil that spilled from the Argo Merchant.

[From the New York Times, Dec. 23, 1976]

THE ARGO MERCHANT DISASTER

The "biggest oil spill disaster on the American coast in our history" is the way Russell T. Train, Administrator of the Environmental Protection Agency, has characterized the wreck of the tanker *Argo Merchant* on the Nantucket shoals. Mr. Train, who is not given to overstatement, was describing the impact of this wholly preventable catastrophe that threatens incalculable damage to the great fisheries on the Georges Bank and to New England's coastal environment.

As in the case of the famous Santa Barbara and Torrey Canyon spills of the 1960's, this one, too, may serve a useful purpose if it galvanizes the public—and governmental authority—into action that will reduce the likelihood of such disasters in the years ahead. Unless strong action is taken, accidents are not only probable, they are virtually certain.

The Georges Bank, besides being one of the world's most important fishing grounds, is also the site of prospective leases on the Outer Continental Shelf, from which it is estimated that some 180,000 barrels of oil a day will be extracted at maximum production. Under present plans, this oil is to be carried by tanker from the offshore wells—thus greatly increasing the tanker traffic in the area and, with it, the probability of similar wrecks—and spills.

The far safer method of removing the oil would be by pipeline running ashore from the well heads. It is not a method that commends itself to the oil companies because the relatively low yield of oil expected might not economically warrant the additional cost. But if the site is considered that minimally productive, why drill there at all?

The affair of the *Argo Merchant* raises several other questions that need thorough study before offshore drilling in the Atlantic becomes a fixed procedure. The ship, which had an appalling history of previous accidents, was so far off course that knowing observers in the area wonder whether its skipper was not deliberately taking a short cut in order to trim costs, a practice they suggest is not uncommon. If so, why has it been allowed? It is fair to ask, too, whether the Coast Guard is as powerless as it appears to be to contain oil spilled in the rough Atlantic. If it is, that is additional testimony against offshore drilling in those waters. In addition, the ship's record raises serious questions about the policing of all tanker operations, apart from the offshore drilling issue.

The fishermen of the Georges Bank will be fortunate if the spill from the *Argo Merchant* does not do long-term damage to the spawning grounds on which their industry depends. The people of the coastal area will be fortunate if a sudden shift in the tides does not bring disaster to their great resorts. Along the rest of the Atlantic Coast, residents will be fortunate if the lessons of the *Argo Merchant* are not lost on those who have the responsibility of deciding whether or not offshore oil is worth the possible price.

[From the New York Times, Dec. 23, 1976]

TANKER BOW SPLITS, SPILLING LAST OF OIL IN SEA OFF NANTUCKET

[By John Kifner]

Boston, Dec. 22.—The bow of the broken Liberian-flag tanker Argo Merchant, grounded off Nantucket Island, split in half today and spilled the remainder of the vessel's 7.5 million gallons of thick, gummy oil into the sea.

The breakup thwarted the Coast Guard's plans to recover the approximately 1.5 million gallons of oil left on the ship. The oil spill was thus left to the mercy of the high winds and rough seas. Therewas no way, experts in the field said, to recover the oil.

Fortuitous winds during the day continued to move the oil slick toward the east and south, away from the resort island of Nantucket and Martha's Vineyard, the New England shores and beaches and away from most of the prime fishing grounds in the area of Georges Bank.

The slick was running in a cone-shaped pattern, extending for about 100 miles, with a width of about 35 miles at its biggest point to the east by southeast of the stricken ship, the Coast Guard operations center at Otis Air Force Base on Cape Cod said tonight.

WINDS OF 29 MILES AN HOUR

The wind was holding from the west-northwest at 29 miles an hour, the National Weather Service reported, continuing to push the oil slick away from the areas of major concern.

The aging, 640-foot tanker, with a long record of maritime mishaps, ran aground of the Nantucket shoals last Wednesday morning, 27 miles southeast of Nantucket. As the oil seeped from its hull, a special Coast Guard task force struggled to pump out the heavy No. 6 oil, but was driven off by storms and heavy seas. Yesterday, the hull broke in half, spilling the bulk of the cargo.

The impact of the spill remained uncertain today as fisheries experts, marine researchers and state and Federal environmental protection officials gathered here to assess the magnitude fo the disaster. In volume, it is believed to be the 10th biggest spill in history.

Robert White, the director of the National Oceanic and Atmospheric Administration, asked at a news conference this afternoon how bad the situation was, replied "I don't know."

Russell Train, the head of the Federal Environmental Administration, told the same conference at Boston's Logan Airport that "the potential is there for serious, adverse ecological effect." Mr. Train said that a preliminary analysis indicated that a substantial amount of the oil was suspended just below the surface of the water.

At the National Marine Fisheries Services offices in Woods Hole, Mass., Julius Posegay said that the rough weather had hampered research efforts and that it was too early to tell what the effect of the spill would be. But, he cautioned, "there is a problem in separating what may be the short-term effects from the long-term effects."

Research vessels from Woods Hole and from the University of Long Island sailed into the oil spill area today to collect samples of the oil and of marine life. In Boston, about 50 scientists from government agencies and universities gathered at the offices of the Environmental Protection Agency to begin efforts to assess the situation. Along the New England coast, volunteers and state workers set up watches along the beaches in case the oil begins to wash ashore.

The breakup of the bow of the Argo Merchant in the cold, pounding seas was discovered by the first Coast Guard flight over the area at midmorning.

The bow had been afloat, the prow pointing upward at a sharp angle, twisted around so that it lay almost next to the awashed stern of the ship.

The bow had split just in front of the forward deck house, leaving the ship in three pieces, according to Petty Officer Richard Griggs, a Coast Guard spokesman. It appeared, he said, that virtually all of the oil had spilled out. The seas were too rough to maneuver the tug Sheila Moran, which along with the Coast Guard Cutter Vigilant, has been standing by the stricken vessel. The wind this morning was at 50 knots, with 15-foot seas and freezing spray.

Last night, Captain Lynn Hien, in charge of the Coast Guard salvage effort, laid plans to attempt to refloat the sections of the ship, which still had oil in the tanks, and tow them out to sea and sink them.

The No. 6 oil, used to fuel industrial powerplants is difficult to ignite, and because the patches are spread apart in rough seas, a fire would probably soon be extinguished. And, in one attempt to use such a technique off the coast of Spain in 1969, the burning oil caused a fire storm that sucked air into a vertical column, carrying unburned oil with it which fell, days later, as a greasy rain, ruining farmland.

The heavy seas and the far-ranging size of the spill also meant that attempts to pick up the oil slick with skimmers or to break it up with chemical dispersants could not be used, Mr. Keough said.

[From the New York Times, Dec. 23, 1976]

TANKER'S HISTORY SHOWS 19 MAJOR TROUBLES SINCE 1964

Cambridge, Mass., Dec. 22—The Liberian tanker that was torn apart yesterday on Middle Rip Shoals off the Cape Cod coast was an unlucky ship with many more than her share of breakdowns and other casualties in her lifetime, says a research center.

The 640-foot Argo Merchant has had at least one other name and three other owners since she was built in 1953 in Hamburg, Germany, the Center for Short-Lived Phenomena reported yesterday.

The center, which operates an environmental alert network studying oil spills, earthquakes, volcanic eruptions and similar occurrences, said the Argo Merchant had been involved in 19 major incidents since 1964.

UNDER INDONESIAN FLAG IN 1969

In one problem-plagued voyage, it took her nearly eight months to travel from Singapore to the West Coast of the United States. "We have statistics indicating the average tanker has about one casualty every three years," said the center's director, Richard Golob.

He said the tanker was named Arturus when first owned by Boots. Dammers & Vanderhyde Shipping & Trading Company and operated under the Liberian flag.

Mr. Golob said she was sold in 1969 to an Indonesian company and operated under that country's flag for one year before being sold again in 1970 to Vary Chiamarese S.A. and operated by Transocean Steamship Agency of New York.

She returned to Liberian registry when sold to the present owner, Thebes Shipping Inc., and operated by Amership Agency of New York.

The environmental research agency said its record of the Argo Merchant's troubles went back only to 1964, and it had no knowledge of any problems up to then.

Here is the center's chronology of the ship: July 1964, the tanker sustained damage to its machinery, propeller blades and shaft; December 1964, both turbo generators, which produce the ship's power, were knocked out at Naples, August 1965, the feed pump that brings water to the ship's boilers was damaged, and she was delayed four days at Cristobal in the Panama Canal Zone, and April 1967, the tanker collided with a motor vessel in Japanese waters, sustaining heavy damage, including 19 plates, to the bow structure. There was no oil spill.

TRIP TOOK TWO-THIRDS OF A YEAR

May 1967, the ship required nearly two thirds of a year for a trip from Singapore to the Untied States West Coast because of four separate problems. There were three fires in the boilers, requiring her to be towed back to Singapore. She did not clear Singapore for good until July 8, but 16 days later her engines broke down and she was towed to Osaka, Japan, for more repairs. When on the way again, she lost power at sea because of boiler trouble and diverted to Honolulu, limping in under her own power. She left Honolulu Nov. 20, was quickly hit by electrical problems, and returned. When she finally resumed her voyage she completed the run to the West Coast.

May 1968, the tanker hit a quay while trying to dock at Madras, India, and her stern plating was extensively damaged.

June 1968, while she was maneuvering to enter Madras harbor, boiler trouble cropped up and water started leaking into the engine room. Because she had no power, the water could not be pumped out, and it rose three feet above the floor plates before it was controlled.

ESCAPES DAMAGE IN GROUNDING

September 1969, the tanker went aground off the Borneo coast for 36 hours, but no damage was reported and no oil was spilled. She was refloated with assistance of two tugs and other vessels.

May 1970, while she was in a Singapore shipyard for repairs, a surveyor examined her and reported the machinery was in serious condition and must be completely overhauled.

October 1970, while at a Yokohama shipyard, damage to a turbo generator was discovered in a routine propeller test.

March 1971, the tanker went aground off Calabria, Italy, and was there for 60 hours before being refloated and towed to Greece, where damage to the rudder was discovered. No oil spill.

April 1971, a turbo generator was damaged extensively because of boiler problems while she was in Marseilles.

November 1973, while going from Venezuela to Honduras, the ship broke down and had to be towed to Curacao.

October 1974, while on the way from Trinidad to Baltimore, the tanker had boiler problems and had to be towed to New York. Examination indicated both boilers had burned out because of lack of water. They had to be retubed.

February 1976, delayed 11 days at Puerto Cortez in Honduras for repair of burned out boiler fans. The fans pump air into the boilers for good combustion.

Mr. Golob said his records indicated about one-third of the world's tanker capacity is under Liberian registry.

He said that while some of the Argo Merchant's problems could be termed incidents, the word used in the tanker industry for them is "casualty."

[From the New York Times, Dec. 23, 1976]

NANTUCKETERS UNDERSTAND FRAGILITY OF ISLAND FAR AT SEA

(By Christopher Lydon)

Nantucket, Mass. Dec. 22.—The miracle of Nantucket was always that it survived at all. For all the summertime splendor of Main Street's mansions and shops, for all the pristine perfection of nearly 1,000 townhouses of the whaling era and before, the island still looks from the air like a wisp of sand dunes. Herman Melville called it an "anthill in the sea" in Chapter 14 of "Moby Dick" and marveled: "Look at it—a mere hillock, an elbow of sand; all beach, without a background. There is more sand there than you would use in 20 years as a substitute for blotting paper. Some gamesome weights will tell that you have to plant weeds there, they don't grow naturally; that they import Canada thistles; that they have to send beyond seas for a spile to stop a leak in an oil cast."

As the worst oil leak ever in American waters moved tentatively away from Nantucket's beaches, the temptation among islanders here was to be cavalier. "We're used to these natural disasters," said Robert F. Mooney, the town prosecutor, turning puckish. Maybe we'd better send an emergency message to Plains, Ga., and ask for more reporters up here."

Nantucket in the wintertime is a proudly isolated town of some 5,000 weatherproof souls who voted last spring to start construction of an airport motel designed to service oil and drilling workers on fish-rich Georges Bank off the Nantucket coast; at the same time Nantucketers were voting by a margin of 3 to 2 against the so-called Kennedy Bill that would have put land and wildlife protection into the powerful hands of the Federal Government.

The islanders view has long been that they, and perhaps only they, understand the fragility of this "land far out to sea," as the Indians named it, because they have lived with the immense power of wind and water 30 miles out in the North Atlantic. Accordingly visitors inquiring about the *Argo Merchant* oil emergency are sometimes treated to amused disdain. "Remember that two reporters in one day is at least one too many for most Nantucketers," Mr. Mooney said. "We're not used to being followed around by 'the boys on the bus.' "

"I'm not that upset," said Walter Glidden, Nantucket's busiest fish dealer, "because I'm a guy that takes one day at a time. I've never seen anything like this before. What are you going to do?"

The most piercing scorn is reserved for the oil company spokesmen who only 2 weeks ago asserted at a public hearing in Boston that he learned in the Gulf of Mexico all that is needed to be known about cleaning up possible oil spills in the Georges Bank. One plan for getting oil from Georges Bank to the mainland was through the use of tankers such as the *Argo Merchant.* In the current crisis, all the authorities have said that they are helpless to do anything about the tanker that split on the Nantucket shoals.

K. Dun Gifford, a Boston real estate man and president of the Nantucket Defense Fund, a conservation group, observed today, "It all brings back to me the seaman's prayer: 'Oh God, thy sea is so great, and my boat is so small.' "

The lesson here, though islanders doubt that outsiders and especially the oil industry will learn it, involves humility before the natural elements.

"It's probably our good fortune," said Bob Dennis, a sport fisherman and activist member of the Nantucket Land Council, "to be shown the impact of an

oil spill. But what kind of good fortune is that? I don't think if they'd drilled off Georges for 20 years they would have spilled the 7 million gallons that were in that tanker."

A Nantucket whaleman that Melville celebrated is extinct. Melville wrote, "Two-thirds of this terraqueous globe are the Nantucketer's. For the sea is his; he owns it as Emperors own empires."

But commercial fishing has been resurgent here, as are the mainland coast of New England, and the gravest concern about the oil damage (much more than for tourism) was being expressed by fishermen, not only for their balance sheets but for the natural balance of marine life.

Bill Blount, a red-bearded 31-year-old, originally from Newport, R.I., is one of numerous young men, mostly college-educated entrepreneurs, son of the middle class, who have undertaken the rugged fishing business of Nantucket. They have done well in it. An aggressive fisherman with an agile boat can net between $50,000 and $100,000 a year.

And they had hoped to do better with the new 200-mile limit protecting coastal fishing grounds from foreign intruders. Today on Straight wharf, waiting for this morning's stiff wind to calm, Mr. Blount worried about long range effects of the spill. "If it gets down to the bottom, he said, "it will still be bubbling up 10 years from now. It will never be gone.

"It's going to cut out a big fishing area that I might have worked on," Mr. Blount said, "You see, fish migrate through the Nantucket Shoals, and some of them are spawning there now. Codfish, yellowtails, flounders, daylights, sand dabs and sea dabs, haddock, grey sole and lemon sole—all your winter fish spawn up and down this coast from December into the spring, and all that oil rolling around is going to spread a lot of poison over the eggs and young fish.

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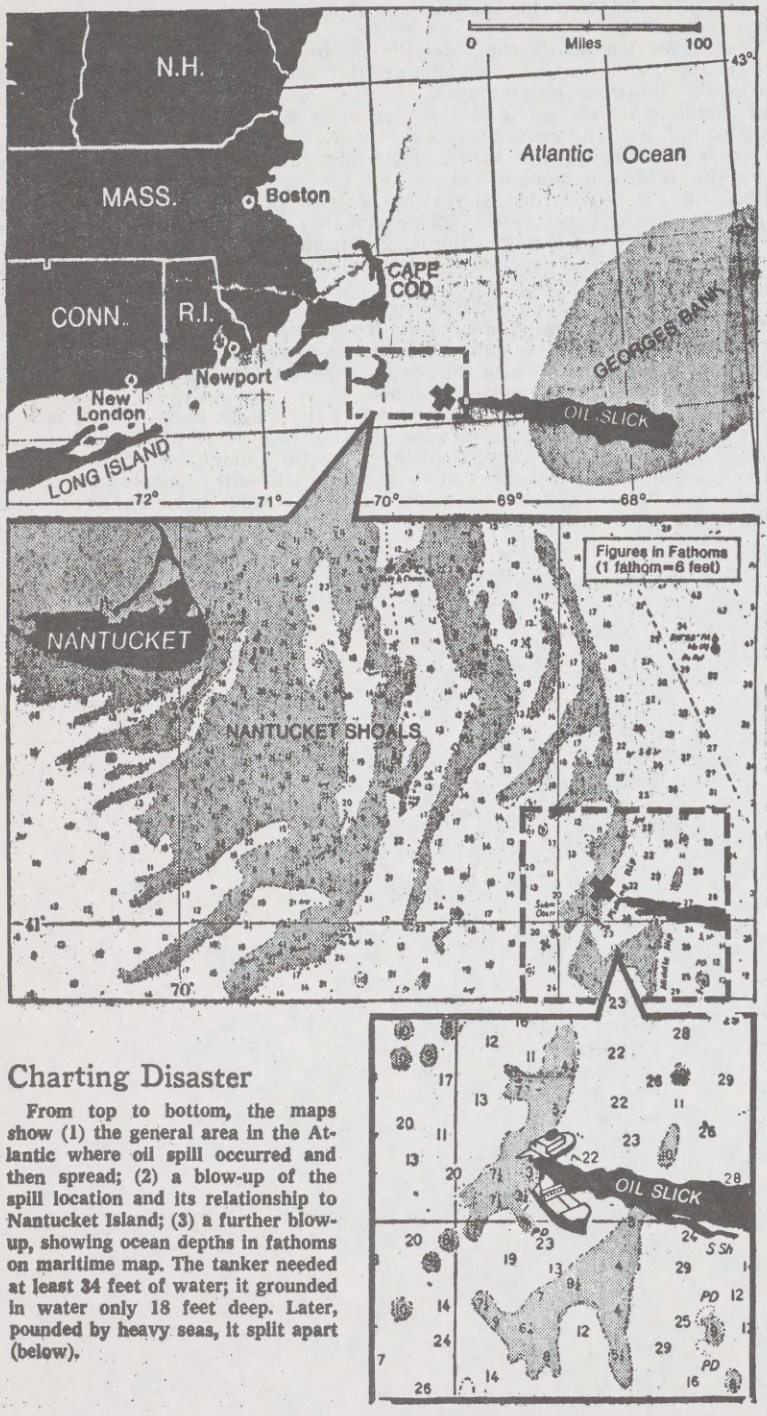

Charting Disaster

From top to bottom, the maps show (1) the general area in the Atlantic where oil spill occurred and then spread; (2) a blow-up of the spill location and its relationship to Nantucket Island; (3) a further blow-up, showing ocean depths in fathoms on maritime map. The tanker needed at least 34 feet of water; it grounded in water only 18 feet deep. Later, pounded by heavy seas, it split apart (below).

[From the New York Times, Dec. 26, 1976]

THE DESTRUCTIVE ISLAND OF OIL

Crude oil, some of it as thick as pudding and polluting 2,850 square miles, has been set loose off the shore of Nantucket by a grounded tanker, and it has a destructive capacity that is essentially immune to human alteration.

How much destruction the oil does depends on which direction natural forces drive it, and oceanographers say they cannot tell precisely in advance; the oil is in an area (about 27 miles off Nantucket Island in the Atlantic) with shifting winds and currents. After it spilled last Tuesday and Wednesday, it first drifted northeastward, then southeastward. There are three possibilities now, none of them happy ones:

If the oil eventually goes in a northeastward direction, it will befoul Georges Bank, the ocean's "mine" of fish that is the resource of a multimillion dollar industry, not only for American fishermen but for foreign vessels as well. The gummy oil will ruin clams, scallops, cod, flounder, haddock and whiting on which thousands of people depend for their living.

If the slick turns landward, it could smother freshly laid lobster eggs floating near shore, destroy the tiny sea creatures on which fish and birds feed and ruin the beaches and shoreline that are one of the nation's main tourist attractions.

The least damage would result if the oil were carried into the mid-Atlantic, away from shore and Georges Bank. However, experts believe that even there it would do long-lasting harm to the ecology, chiefly in ways not yet understood. It is know that the hydrocarbons in oil are toxic to phytoplankton, tiny ocean plants that produce oxygen, and to zooplankton, animal organisms consumed as food by larger sea life.

According to scientists at the Woods Hole Oceanographic Institute and the National Marine Fisheries Service, oil close to the surface disrupts just one generation of fish, but oil that sinks to the bottom as it oxidizes and gets heavier can disturb generations of ocean life. Fortunately, ecological damage is less in winter than at other seasons: Fewer fish spawn in cold weather, and other biological activity is also at a low ebb.

The oil spilled from the Green tanker *Argo Merchant* after it ran aground; the ship has a draft of 33.6 feet, it his bottom where the depth, on maritime charts, is shown as 18 feet. The ship carried 7.5 million gallons of heavy oil.

It was the biggest spill off American shores, but there have been worse ones elsewhere. Though the spills get public attention, seagoing vessels discharge some oil routinely in the ocean's traffic lanes. The beaches of Bermuda, for instance, have at times been lined with oil globs that float in from a heavily traveled lane not far from the island.

[From the New York Times, Dec. 27, 1976]

WIND SENDS OIL SPILL TO SEA AGAIN AFTER DRIVING IT CLOSER TO EAST COAST

(By John Kifner)

Boston, Dec. 26.—The mass of spilled oil off the New England coast moved 2 miles closer to shore today, but in the afternoon the wind shifted back, coming again from the northwest, to drive it out to sea.

The southeast winds this morning raised concern among standby cleanup crews watching the biggest oil spill off the coast of the United States, the 7.5 million gallons of No. 6 industrial fuel oil dumped from the breakup of the Liberian-flag tanker Argo Merchant.

Coast Guard oceanographers back from a flight over the area late this afternoon were relieved, however, by the weather shift. They described the oil spill as now covering a somewhat hourglass-shaped area, extending over at least 3,000 square miles, with much of the oil seemingly just below the surface in the form of large, flat pancake-like gobs.

The Argo Merchant, operating under a Liberian "flag of convenience," ran aground on the shallow Nantucket Shoals, about 27 miles southeast of Nantucket Island, the morning of Dec. 15.

Stormy seas and high winds blocked the Coast Guard's efforts to control the oil seeping from the battered ship and, pounded for 6 days, she finally broke apart Tuesday morning, then split again, pouring her 7.5-million-gallon cargo oil into the sea.

The Coast Guard and other experts said they were helpless. There was no technology to deal with such a big spill on the rough seas. Indeed, no one really knew what the oil spill would do, and the experts could only hope that it might be carried out past the Outer Continental Shelf, where the damage might be minimized.

A major fear here is that the spill will foul the Georges Bank, one of the world's richest fishing areas. Some of the spill is over part of the Georges Bank now, near a rich scallop harvesting area.

Jay Lanzillo, the head of the Cape Cod Commercial Fishermen's Coalition, said in a telephone interview today that the situation was even more critical because the fish in the area have been reduced by the huge foreign fishing fleets in recent years. The coalition has sued the owners of the ship and the oil for $60 million in damages.

At the Environmental Protection Agency's National Marine Laboratory at Narragansett, R.I., scientists are preparing a task force to evaluate the impact on marine life from the spill. The overall investigation of the disaster is under the direction of the Coast Guard.

Dr. John Prager, chief of technical assistance at the center, said that three research vessels—the Delaware, belonging to the National Marine Fishery Service; the Oceanus from the Woods Hole Oceanographic Institute and the Endeavor from the University of Rhode Island—would take samples of marine life and make other studies.

The Delaware had already gone to sea, he said, and trawled for samples of hake, yellowtail flounder, sand dabs, scallops, lobster and skate. The ship had been working in areas near, but not in, the oil spill, and early reports indicated that the oil had not settled on the samples they took, Dr. Prager added.

What will eventually happen to the oil is uncertain, a Massachusetts Institute of Technology professor Jerome H. Milgrim, said. He said that his preliminary testing of samples from the spill indicated that the oil would not sink, as had earlier been widely feared.

But, Steve Dorrler, an Environmental Protection Agency scientist, said that earlier tests in New Jersey on a simulated spill of oil similar to No. 6 indicated that, when rocked by waves, the oil might first form a kind of emulsion called a mousse, form small globules the size of a pea and then sink. At the University of Rhode Island, a computer projection indicated that globules of oil, carried from the bottom by ocean tides, might wash up on the coast this summer.

CONCERN OVER DRILLING PLAN

The oil spill also increased concern in some quarters here over plans to drill for oil in the Georges Bank area. Last week, Senator Edward M. Kennedy, Democrat of Massachusetts, and the Environmental Protection Agency's director, Russell E. Train, called for a delay until June in the letting of leases for oil drilling off the New England coast now scheduled for March.

Current plans call for the oil from the drill sites to be carried by tankers rather than pipelines if the oil producers decide the oilfield is relatively small.

[From the New York Times, Dec. 29, 1976]

GROUNDING OF TANKER LINKED TO NAVIGATION

(By Arnold H. Lubasch)

Capt. Georgios Papadopoulos of the oil tanker Argo Merchant indicated yesterday that faulty navigational equipment or the way it was used might have caused the ship to go aground on shoals off Nantucket Island 2 weeks ago.

The short, dark-haired, 43-year-old captain testified for the second day in Federal District Court in Manhattan. The court hearing concerns damage claims regarding the massive oil spill that resulted from the grounding of the tanker which had strayed off course in the Atlantic.

Douglas A. Jacobsen, an insurance lawyer, questioned Captain Papadopoulos about the tanker's radio directionfinder, an instrument that picks up short-range radio signals from shore to determine a ship's position at sea. The captain said the instrument had indicated that the Argo Merchant was on course shortly before going aground.

"So there had to be something wrong," the lawyer added, "either with the radio directionfinder equipment or the way you were using it?"

"Yes" Captain Papadopoulos replied in a soft voice.

"What do you think it was?" the lawyer asked him.

"I don't know," the captain answered. "If I knew, then the ship would not have stranded."

GYROCOMPASS OUT OF ORDER

Replying to additional questions, he said that he had been trained in the use of radio directionfinders, and added that he was competent to use the equipment when it was working properly. He testified earlier that another navigational instrument, a gyrocompass, was not working properly as the Argo Merchant approached Nantucket.

Captain Papadopoulos, who wore a gray suit in court, spoke in heavily accented English and turned occasionally to a Greek translator for assistance in understanding questions and giving answers.

When asked about the ship's course, the captain put on a pair of horn-rimmed glasses to study detailed charts of the voyage. He testified that his Liberian-flag tanker had not changed course for several hours and was proceeding at a normal speed of more than 8 miles an hour when it ran aground at 6 a.m. on Dec. 15.

He and other officers of the Argo Merchant were on the bridge when the ship went aground before dawn, the captain said. The grounding resulted in spilling 7.5 million gallons of heavy industrial oil into the Atlantic, near a valuable fishing area off the coast of Massachusetts.

The Continental Insurance Company, which insured the oil cargo for more than $2 million, must pay the owner of the oil for its loss. The insurance company is seeking to recover the loss from the tanker's owner, listed as the Thebes Shipping Company. But Thebes filed a court petition to limit the company's liability to the current value of the tanker, which is now a wreck in the Atlantic.

The crucial issue in the continuing court hearing is whether the Argo Merchant was seaworthy when she began the final voyage from Venezuela on the way to Salem, Mass., because the tanker's seaworthiness will determine whether the owner's liability can be limited under United States law. The liability cannot be limited under Federal law if the ship's owner knew or should have known that the Argo Merchant was not seaworthy.

Massachusetts fishermen have filed a suit in Boston seeking millions of dollars in damages as a result of the oil spill. The ship's owner filed its petition in Manhattan, resulting in the hearing, which will resume today.

FALMOUTH, MASS., Dec. 28—The sticky, 130-mile-long slick from the Argo Merchant is shriveling and disintegrating and probably will not seriously harm sea life, oceanographers said today.

The slick broke into two huge sections, which were drifting in the wind away from shore at a speed of four to five miles a day, the scientists said.

Coast Guard official sand oceanographers from the National Oceanic and Atmospheric Administration described the problems of dealing with the oil at a briefing at the Coast Guard Air Station here.

[From the New York Times, Dec. 30, 1976]

TANKER CAPTAIN SAYS HE HAD WRONG NANTUCKET CHART

(By Arnold H. Lubasch)

Capt. Georgios Papadopoulos testified yesterday that his oil tanker, the Argo Merchant, lacked an up-to-date chart for the currents near Nantucket Island when the ship ran aground and poured 7.5 million gallons of oil into the Atlantic.

In addition, he said, one of the Argo Merchant's two boilers malfunctioned many times in the past, a condition that could have affected the ship's speed and direction. He also said that an instrument for recording the ship's course on a graph that had been broken for one or two months. The captain testified earlier that the gyrocompass, a key navigational instrument, was not working properly for many hours before the Argo Merchant went aground on Dec. 15. And

he had acknowledged that the tanker did not have a long-range electronic navigation system.

His testimony went on for 3 days in Federal District Court in Manhattan at a hearing about the shipowner's liability for damages resulting from the huge oil spill caused by the Argo Merchant. The Liberian-flag tanker had strayed 24 miles off course before striking the Nantucket Shoals enroute to Salem, Mass.

According to the captain, as he approached Nantucket he had adjusted his course to compensate for the currents and weather, but he had used a chart showing the currents for November, although it was then the middle of December. He said that there had been no chart for December aboard the tanker.

Captain Papadopoulos acknowledged that the currents were different for the 2 months. He put on a pair of hornrimmed glasses to study the November and December charts when they were shown to him by an insurance lawyer in the court hearing.

The lawyer, Douglas A. Jacobsen, sought to show in the testimony elicited from the captain that the Argo Merchant had not been properly equipped on the voyage that ended in the disaster off Nantucket Island 2 weeks ago. The seaworthiness of the tanker is a crucial issue in the case.

The Thebes Shipping Company, the listed owner of the tanker, initiated the court session in Manhattan by filing a petition to limit the company's liability to the ship's present value. The wrecked tanker is now worthless so there would be virtually no liability for damages, if the petition succeeds.

Under a United States law, the liability can be limited to the value of the vessel if the owner can show that the ship was seaworthy at the start of the voyage that ended in the accident. Joseph Smith, a lawyer for Thebes, will attempt to show that the Argo Merchant was seaworthy when she left Venezuela on Dec. 5 at the start of her final voyage.

SAYS SHIP SEEMED ON COURSE

Mr. Jacobsen, a lawyer for the Continental Insurance Company, wants to show that the owner knew or should have known that the tanker was not seaworthy. Continental, which insured the oil cargo for more than $2 million, seeks to recover the cost from the ship's owner.

In questioning the captain, Mr. Jacobsen tried to demonstrate that the Argo Merchant was operated by the Amership Agency Inc. The lawyer indicated that Amership was more than merely the tanker's agent and therefore might also be liable to a damage suit.

Captain Papadopoulos, testifying on the key question of navigational problems, said that the ship had appeared to be on course shortly before she ran aground. He said that he had received this indication from the tanker's radio direction-finder, an instrument for picking up short-range radio signals to fix a ship's position at sea.

The 43-year-old captain, a skipper for 9 years who took over the Argo Merchant last June, testified that there must have been something wrong with either the radio directionfinder or the way he had used it.

The tanker's second in command, Georgios Ypsilantis, testified that he supported much of the captain's testimony, including the description of the use of the radio directionfinder.

Sol Schreiber, a Federal magistrate who is supervising the taking of the testimony in the continuing court hearing, asked what had caused the tanker to go off course. Mr. Ypsilantis replied that he thought the currents were to blame.

[From the New York Times, Dec. 31, 1976]

Tanker Mate Looked for Lightship in Vain

(By Arnold H. Lubasch)

Top officers of the oil tanker *Argo Merchant* remained on the bridge for several hours to see the Nantucket Lightship before the tanker ran aground, according to testimony yesterday in Federal District Court in Manhattan.

Georgios Dedrinos, a second mate on the Argo Merchant, said that he stayed on the bridge of the tanker after his watch ended at 4 a.m. on December 15. He

added that he had been helping the captain and the chief mate, who were striving to sight the lightship, a key navigational aid marking the Nantucket Shoals. The tanker, which was supposed to be heading toward the lightship had strayed 24 miles off course.

Replying to questions by Douglas A. Jacobsen, an insurance lawyer, Mr. Dedrinos said that he had expected to see the Nantucket Lightship by 4 a.m., 2 hours before the *Argo Merchant* ran aground on the shoals. But the lightship was not sighted, he said, even though he had believed that the tanker was on the proper course.

"You didnt' see the Nantucket Lightship at any time?" the lawyer asked.

"No, never," Mr. Dedrinos replied, adding that he had thought not sighting the lightship had meant that the tanker was slow.

His testimony came on the fourth day of a continuing hearing regarding a petition by the owner of the *Argo Merchant* to limit liability for damages growing out of the huge oil spill from the tanker. The testimony is being transcribed for later use, when a Federal judge is expected to conduct a trial to decide whether to grant the petition to limit the owner's liability for damages.

The first apparent discrepancy in the testimony occurred when Joseph Roach, a 40-year-old helmsman from Trinidad, said that he always used a magnetic compass when he steered the ship by hand.

The captain, Georgios Papadopoulos, testified earlier that a gyrocompass was normally used for steering until the evening of December 14, when he ordered that the magnetic compass be used because the gyrocompass was functioning erratically.

There was no immediate explanation for the apparent discrepancy between the captain and the helmsman regarding the gyrocompass, which is generally regarded as a more sophisticated and more accurate instrument than a magnetic compass. Navigational equipment board the *Argo Merchant* is a major factor in the question of whether the tanker was seaworthy.

The tanker's owner, listed as the Thebes Shipping Company, wants to limit the company's liability to the current value of the wrecked tanker, which is worthless. Under Federal law, the liability could be limited to the vessel's value if the *Argo Merchant* was ruled to have been seaworthy at the start of the voyage that ended in the grounding near Nantucket Island 2 weeks ago.

A coalition of New England fishermen filed a suit in Boston seeking millions of dollars in damages from the owner and the captain of the *Argo Merchant*. But Judge Thomas P. Griesa ruled in the Federal District Court in Manhattan late yesterday that the Boston case could not proceed pending a decision on the petition for limitation of liability.

LETTERS

FEDERAL AVIATION ADMINISTRATION,
Washington, D.C., January 11, 1977.

Hon. EDWARD M. KENNEDY, *Chairman,*
Subcommittee on Administrative Practice and Procedure
Washington, D.C.

DEAR MR. CHAIRMAN: We understand that in your December 22, 1976, hearings in Boston, you mentioned the possibility of monitoring, by the use of satellites, maritime traffic carrying environmentally hazardous cargo within the 200 mile zone. Your staff recently contacted us concerning this matter; Mr. Schneider apparently had been informed of the FAA's involvement in an interagency task force investigation of the joint use and combination potential of existing and planned satellite systems for providing communications, navigation and surveillance services for civil aeronautical and maritime users.

The principal thrust of the task force effort has been directed to the air traffic control (ATC) aspects of joint use combined function satellite systems. However, maritime requirements and satellite systems were included because of the common characteristics (coverage region, frequency band of operation, etc.) of these systems with civil aeronautical systems. The data on maritime operations and concerns was provided by representatives of the Maritime Administration of the Department of Commerce and we suggest that they be contacted for specific information relating to maritime systems and operations.

A draft version of the task force report is being coordinated with the agencies involved. The final report is not available at this time, but can be provided upon its completion. However, it is possible to summarize certain of the initial con-

clusions of the task force which appear relevant to the technical feasibility of "monitoring" maritime traffic and further, to indicate a few near term concepts for accomplishing this function within the 200-mile limit.

The task force concluded that current operational technology supports the application of satellites for communication and position determination of aircraft and ships in oceanic areas. Specifically, it is possible to provide satellite "monitoring" of ship traffic within the 200 n. mi. zone. The availability of satellites, user equipment and the cost of accomplishing the monitoring was not addressed by the task force.

Some concepts for consideration would include:

1. The use of acceptable quality on-board navigation (position) data which could be transmitted via satellite to a central monitoring facility. The Marisat maritime communication satellite system of COMSAT General would appear appropriate for this application.

2. The loran-C and Omega systems would provide acceptable on-board navigation capability. The DOD's NAVSTAR Global Positioning System (GPS) would provide significantly improved accuracy navigation data, but this system is currently experimental. If an operational decision is made, the system is not scheduled to be available until the early eighties.

3. The use of a system similar to the AEROSAT Evaluation System which provides oceanic communication services and satellite-based position surveillance. The current AEROSAT program is an experimental program intended for aeronautical use only and is planned to provide a means for evaluating the use of satellites for ATC services in the North Atlantic. This international program will have satellites deployed in the 1980 time period.

If we can be of further assistance in this area, please contact us at your convenience.

Sincerely,

KEITH D. MCDONALD,
Executive Secretary, Interagency Task Force on Satellite Systems.

THE COUNCIL OF AMERICAN MASTER MARINERS, INC.
New York, N.Y., January 5, 1977.

Hon. EDWARD M. KENNEDY,
Washington, D.C.

Re East Coast shipping safety fairways

DEAR SENATOR KENNEDY: Stimulated by the interest you have evidenced in the recent maritime disasters, we are taking the liberty of forwarding you a copy of the statement presented by the president of the Council of American Master Mariners, Inc., at the public hearing held in Boston, Massachusetts on December 8, 1976, by the Department of the Interior, Bureau of Land Management, on the proposed Outer Continental Shelf Oil and Gas Lease Sale No. 42.

Copies of these statements were sent to Lt. General John W. Morris, U.S. Army Corps of Engineers and to Vice Admiral O. W. Siler, Commandant of the United States Coast Guard, on December 15.

To date we have had no indication that the statements were received or that any action has been initiated by either of these agencies.

Very respectfully,

RAYMOND E. SALMAN,
National Secretary.

Enclosure.

U.S. SENATE,
December 22, 1976.

Hon. RUSSELL E. TRAIN,
Administrator, Environmental Protection Agency,
Washington, D.C.

DEAR RUSSELL: The tragic oil spill off Nantucket which threatens the despoil the beaches and marine resources of the New England area demands careful and continuous evaluation as to immediate and long-term ecological impact. The people of New England who rely on fishing for a livelihood must have information about any dangers posed to the fishery resource. And, while some of the effects of an oil spill of this magnitude may be obvious, knowledge of the long-term effects of oil in our marine environment is limited.

For this reason, I think it would be appropriate for the Environmental Protection Agency to undertake an immediate investigation of the direct conse-

quences of this spill on the fishery resources and recreational activities of the northern New England coastal states. A second part of this investigation should focus on the potential long-range effects of oil spills on the delicate balance of our marine ecosystems. Our knowledge of this latter issue is so inadequate as to make it impossible to assess the real environmental and economic implications of oil pollution.

I am sure you would agree with me that a study of the short-term effects of this particular spill and the long-term effects of oil pollution on our marine environment would be a valuable addition to our current body of knowledge. Your prompt action on this matter would serve a useful purpose.

Sincerely,

EDMUND S. MUSKIE, *U.S. Senator.*

NATURAL RESOURCES DEFENSE COUNCIL, INC.,
New York, N.Y., December 23, 1976.

Hon. EDWARD M. KENNEDY,
Subcommittee on Administrative Practice and Procedure, Washington, D.C.

DEAR SENATOR KENNEDY: The Natural Resources Defense Council, a national environmental organization with a membership of approximately 30,000, would like this letter and the attachments to be included in the record of the hearing on the *Argo Merchant* oil spill held by the Subcommittee on Administrative Practice and Procedure in Boston, Massachusetts on December 21, 1976.

This disastrous spill raises very serious questions, not only about the adequacy of tanker transport regulation and oil spill liability legislation, but also the Interior Department's proposed leasing of the Outer Continental Shelf for oil and gas development. The Natural Resources Defense Council has monitored the development of the Interior Department's Outer Continental Shelf oil and gas leasing program since its inception in 1974. We are very deeply concerned because we believe that the Georges Bank lease sale 42, as proposed, creates the potentiality of an oil spill as serious as that of the *Argo Merchant.*

NRDC's position is based on the following facts:

1. The Interior Department proposes that oil from the Georges Bank be transported ashore via tankers of between 30,000 and 70,000 deadweight tons. The *Argo Merchant* was 40,000 deadweight tons.

2. The Coast Guard has inadequate safety regulations covering tankers of this size. As a result, the Georges Bank oil would be transported by tankers which are not required to have segregated ballasts, doublebottom hulls, adequate maneuverability, or other essential safety features.

3. The United States Geological Survey has determined that at least one major oil spill would occur as a result of lease sale 42.

4. As demonstrated in the *Argo Merchant* disaster, oil spill containment and cleanup technologies are rendered inoperable in adverse weather conditions in the North Atlantic, and the draft environmental statement on sale 42 indicates that there is little likelihood of improvements in this technology in the foreseeable future.

5. The routing of tankers from the Georges Bank area is likely to be adjacent to the Nantucket Shoals on the way to refineries in New Jersey.

Because a oil spill as serious as the *Argo Merchant* spill could occur from the Georges Bank sale 42, it is essential that this committee consider the leasing program and its consequences, when attempting to evaluate the full impact of the *Argo Merchant* spill on the New England region's tourism and commercial fisheries' economies. The *Argo Merchant* spill cannot be treated as an isolated event.

We think it essential for this committee to weight the potential cumulative impacts to the continued productivity of the Georges Bank fishery by making this productive area vulnerable to another major oil spill.

We attach NRDC's comments on the draft environmental impact statement of proposed lease sale 42. They outline what NRDC sees as the specific deficiencies in the proposed Outer Continental Shelf leasing program. We also enclose NRDC's press release on its comments and an editorial from the New York Times of December 23, 1976.

Sincerely yours,

FRANCES BEINECKE.
SARAH CHASIS.

Enclosure

STATUS OF IMCO CONVENTIONS

DECEMBER 30, 1976.

1. This paper updates the status of IMCO Conventions which have not been ratified by the U.S. and/or are not in force, with a view toward aiding the Council in speeding necessary implementing action both domestically and internationally.

a. Safety of Life at Sea, 1960

The U.S. has deposited its instruments of acceptance to both the General and Grain Amendments of 1973, thereby ratifying all Amendments to the Convention. All Amendments remain far short of coming into force, however. As all Amendments are incorporated into SOLAS 74, the major effort should be placed on U.S. ratification of that Convention.

b. Safety of Life at Sea, 1974

This Convention has been placed before the Senate for advice and consent by the President. The Coast Guard has determined that enabling legislation is not necessary. At present, three countries have deposited their instruments of acceptance. 25 are required which must include 50% of the world's tonnage.

c. Collision regulations, 1972

This Convention will enter into force on 15 July 1977. The U.S. has deposited its instrument of acceptance. It is expected that by 20 January 1977 a proclamation and Executive Order will be issued implementing the provisions of the Convention for the U.S.

d. 1969 Amendments to the Oil Pollution Convention, 1954

One more ratification is required for coming into force. This should be forthcoming within 6–12 months. No further action is indicated.

e. Tanker tank size and great barrier reef Amendments, 1971 to the Oil Pollution Convention, 1954

The U.S. has passed enabling legislation for these amendments, but Senate advice and consent is still pending. At present less than half the required countries have deposited their instruments of acceptance. This does not appear to be ripe for any Coast Guard action.

f. Pollution from ships, 1973

Enabling legislation is being prepared by the Headquarters Staff, along with the necessary economic and environmental impact statements.

At present, three countries have deposited their instruments of acceptance of the required 15, which is to include 50% of the world's tonnage. They represent nil tonnage.

g. 1971 Editorial clarification amendments to the Load Line Convention, 1966

Ratified by the U.S. but not yet in force for contracting countries. There is however, no need to expend any effort in trying to bring this amendment into force because they are mainly editorial corrections and the 1975 amendments contain the tacit amendment procedure.

h. 1975 Amendments to the International Convention on Load Lines, 1976

At present, three countries have deposited their instruments of acceptance to these Amendments. 53 required.

i. Tonnage measurement, 1969

Enabling legislation is being drafted by the Coast Guard. Industrial opposition remains, as voiced by the National Off-Shore Advisory Committee. Work has just started in the Maritime Safety Committee which if successful, should nullify most domestic objections, both in the U.S. and in most other countries. Final IMCO action is expected in November 1977. Because of this, a push for international acceptance is not recommended at this time. At present, 30 countries with 56% of the world's tonnage have deposited their instruments of acceptance. 25, which is to include 65% of the world's tonnage, is required.

j. Facilitation of international maritime traffic, 1965 Amendments

(1) Article VII, 1973;

This Article has not yet come into force, with 16 countries, including the U.S., of the required 25 having deposited their instruments of acceptance. As this is a Department of Transportation concern, the Coast Guard need take no action.

k. High seas intervention for marine pollution for substances other than oil, 1973

Enabling legislation (S. 2549) remains before the Congress. Action to gain international acceptance should await U.S. ratification. At present, two countries have deposited their instruments of acceptance of the required 15, which is to include 50% of the world's tonnage.

l. (1) *Civil liability for oil damage, 1969; and* (2) *International Oil Pollution Damage Compensation Fund*

Both Conventions remain before the Senate for advice and consent, and have been excluded from the Super Fund Bill (H.R. 9294, S. 2162). The Bill has died in this Congress. Environmentalist objections to its liability limits remain. The Civil Liability Convention is in force internationally. The International Oil Pollution Damage Compensation Fund Convention is not, with ten countries having deposited their instruments of acceptance of the required eight, with "contributing tonnage" far short of the required 750 million tons. Any action for international acceptance is premature pending U.S. ratification.

m. Safe Container Convention, 1972

This Convention has received Senate advice and consent. Enabling legislation was sent to OMB in May 1976. At present, eight countries have deposited their instruments of acceptance of the required ten. It is not recommended that any effort be made to achieve international acceptance pending U.S. ratification.

n. Amendments to the IMCO Convention, 1974

At present 60 countries, including the U.S. have deposited their instruments of acceptance of the required 68.

o. Amendments to the IMCO Convention, 1975

Six countries have ratified. 68 are required.

2. All other IMCO Conventions and Amendments to Conventions have been adopted, passed and ratified by the U.S.

EXCERPTS FROM UNITED STATES CODE REGARDING NAVIGATION AND SHIPPING

TITLE 33.—NAVIGATION AND NAVIGABLE WATERS

CHAPTER 25.—PORTS AND WATERWAYS SAFETY PROGRAM [NEW]

§ 1221. Prevention of damage to vessels, bridges, and other structures; protection of navigable waters from environmental harm; authority of Secretary.

In order to prevent damage to, or the destruction or loss of any vessel, bridge, or other structure on or in the navigable waters of the United States, or any land structure or shore area immediately adjacent to those waters; and to protect the navigable waters and the resources therein from environmental harm resulting from vessel or structure damage, destruction, or loss, the Secretary of the department in which the Coast Guard is operating may—

(1) Establish, operate, and maintain vessel traffic services and systems for ports, harbors, and other waters subject to congested vessel traffic;

(2) Require vessels which operate in an area of a vessel traffic service or system to utilize or comply with that service or system, including the carrying or installation of electronic or other devices necessary for the use of the service or system;

(3) Control vessel traffic in areas which he determines to be especially hazardous, or under conditions of reduced visibility, adverse weather, vessel congestion, or other hazardous circumstances by—

(*i*) Specifying times of entry, movement, or departure to, from, within, through ports, harbors, or other waters;

(*ii*) Establishing vessel traffic routing schemes;

(*iii*) Establishing vessel size and speed limitations and vessel operating conditions; and

(*iv*) Restricting vessel operation, in a hazardous area or under hazardous conditions, to vessels which have particular operating characteristics and capabilities which he considers necessary for safe operation under the circumstances;

(4) Direct the anchoring, mooring, or movement of a vessel when necessary to prevent damage to or by that vessel or her cargo, stores, supplies, or fuel;

(5) Require pilots on self-propelled vessels engaged in the foreign trades in areas and under circumstances where a pilot is not otherwise required by State

law to be on board until the State having jurisdiction of an area involved establishes a requirement for a pilot in that area or under the circumstances involved;

(6) Establish procedures, measures, and standards for the handling, loading, discharge, storage, stowage, and movement, including the emergency removal, control and disposition, of explosives or other dangerous articles or substances (including the substances described in section 391a(2)(A), (B), and (C) of Title 46 on structures subject to this chapter;

(7) Prescribe minimum safety equipment requirements for structures subject to this chapter to assure adequate protection from fire, explosion, natural disasters, and other serious accidents or casualties;

(8) Establish water or waterfront safety zones or other measures for limited, controlled, or conditional access and activity when necessary for the protection of any vessel, structure, waters, or shore area; and

(9) Establish procedures for examination to assure compliance with the minimum safety equipment requirements for structures.

(Pub. L. 92–349, title I § 101, July 10, 1972, 86 Stat. 424.)

* * * * * * *

TITLE 46.—SHIPPING

CHAPTER 14.—INSPECTION OF STEAM VESSELS

§ 391a. Vessels carrying certain cargoes in bulk.

(1) Statement of policy.

The Congress hereby finds and declares—

That the carriage by vessels of certain cargoes in bulk creates substantial hazards to life, property, the navigable waters of the United States (including the quality thereof) and the resources contained therein and of the adjoining land, including but not limited to fish, shellfish, and wildlife, marine and coastal ecosystems and recreational and scenic values, which waters and resources are hereafter in this section referred to as the "marine environment."

That existing standards for the design, construction, alteration, repair, maintenance and operation of such vessels must be improved for the adequate protection of the marine environment.

That it is necessary that there be established for all such vessels documented under the laws of the United States or entering the navigable waters of the United States comprehensive minimum standards of design, construction, alteration, repair, maintenance, and operation to prevent or mitigate the hazards to life, property, and the marine environment.

(3) Rules and regulations.

In order to secure effective provision (A) for vessel safety, and (B) for protection of the marine environment, the Secretary of the department in which the Coast Guard is operating (hereafter referred to in this section as the "Secretary") shall establish for the vessels to which this section applies such additional rules and regulations as may be necessary with respect to the design and construction, alteration, repair, and maintenance of such vessels, including, but not limited to, the superstructures, hulls, places for stowing and carrying such cargo, fittings, equipment, appliances, propulsive machinery, auxiliary machinery, and boilers thereof; and with respect to all materials used in such construction, alteration, or repair; and with respect to the handling and stowage of such cargo, the manner of such handling or stowage, and the machinery and appliances used in such handling and stowage; and with respect to equipment and appliances for life saving, fire protection, and the prevention and mitigation of damage to the marine environment; and with respect to the operation of such vessels; and with respect to the requirements of the manning of such vessels and the duties and qualifications of the officers and crew thereof; and with respect to the inspection of all the foregoing. In establishing such rules and regulations the Secretary may, after hearing as provided in subsection (4), adopt rules of the American Bureau of Shipping or similar American classification society for classed vessels insofar as such rules pertain to the efficiency of hubs and the reliability of machinery of vessels to which this section applies. In establishing such rules and regulations, the Secretary shall give due consideration to the kinds and grades of such cargo permitted to be on board such vessel. In establishing such rules and regulations the Secretary shall, after consultation with the Secretary of Commerce and the Administrator of the Environmental Protection Agency, identify those established for protection of the marine environment and those established for vessel safety.

COMMENTS OF THE NATURAL RESOURCES DEFENSE COUNCIL, INC.
ON THE
BUREAU OF LAND MANAGEMENT'S DRAFT EIS ON PROPOSED OIL AND GAS LEASE #42

INTRODUCTION

The Natural Resources Defense Council (NRDC) is a nonprofit membership organization dedicated to protecting endangered natural resources. NRDC has a national membership of 30,000, over 8,000 of whom live in the region affected by Proposed Lease Sale #42. NRDC has followed the development of the federal accelerated leasing program since its inception in 1974. We have submitted comments on the Programmatic Environmental Statement and the site specific statement for the Alaskan and Mid-Atlantic lease sales. In addition we are plaintiffs in the litigation, New York, NRDC v. Kleppe, (E.D.N.Y.) which questions the adequacy of the final Environmental Statement for Lease Sale 40.

In our review of the Draft Environmental Statement to OCS Lease Sale 42 (hereafter DES), we have found that it is necessary to oppose Lease Sale 42 as both the Department of the Interior's Proposal and the DES are seriously deficient in a number of important respects.

The DES fails to propose a comprehensive Environmental Studies Program which would provide baseline information as well as determine the susceptibility of marine organisms to hydrocarbon pollution.

The information contained in the DES on the effectiveness of existing oil spill containment and cleanup technology in the North Atlantic is clearly erroneous, as evidenced by its failure in the Argo Merchant spill.

The DES is inadequate as it contains no specific information on the productivity of the Georges Bank fishery, nor of the value of that resource or the tourist industry to the New England regional economy.

The DES fails to provide adequate discussion of proposed mitigating measures, as well as discuss the full range of mitigation possibilities. The mitigating measures proposed are inadequate. The use of pipelines are not absolutely required, nor is pipeline burial. Indeed the DES states that the uses of tankers for transport of the Georges Bank oil is likely.

As the alternatives Section is essentially the same as that in the Sale 40 EIS, there is no indication that the Interior Department has altered or advanced its thinking on alternative energy sources. This is a continuing inadequacy of the OCS drilling program as the Program has never been part of a national energy policy.

The inadequacies of both this draft environmental statement and of the program itself, as detailed in these comments, force NRDC to oppose Lease Sale #42.

The Argo Merchant spill greatly dramatizes the failings of existing technology to protect the marine environment from extensive damage from hydrocarbon pollution. Oil spill containment equipment has proved ineffective in that situation. In addition, the stresses to themarine environment from the Argo Merchant spill are presently unknown. Until the vulnerability and the extent of existing damage to the North Atlantic marine environment can be assessed, any plans for a lease sale in the Georges Bank must be foregone.

I. A. The Proposal

In the description of the proposal to drill for oil and gas on Georges Bank, the Interior Department indicates three goals of the OCS leasing program:

"1) The orderly development of marine mineral resources to meet the energy demands of the nation.

2) The protection of the marine and coastal environment.

3) The receipt of a fair market return for leased mineral resources." Vol. I, p.9.

The Natural Resources Defense Council believes that the proposal does not meet these objectives for the reasons outlined below.

The proposal, and indeed, the accelerated leasing program itself, have never been discussed in the terms of a national energy policy. The amounts of oil and gas in the frontier areas will remain unknown until exploration has been completed; furthermore, the schedule of development of oil and gas is up to the leasees not to the Interior Department. Therefore there is no assurance that the program will in fact help "meet the energy demands of the nation." The proposal, as presented in the DES, inadequately details the potential environmental impacts and does not ensure "protection of the marine and coastal environment."

NRDC cannot support this proposal until the above aims have been met. The information contained in this draft environmental statement indicates that the Interior Department is a long way from achieving these goals.

I.D.2. Environmental Studies Program

There are major deficiencies in this area of the DES and in the projected studies program. No schedule is given explaining when these studies will be completed. If, as is most likely, it is after the leases have been granted, BLM will not be able to follow its objective of using the results to "make better management decisions regarding the development of mineral resources...." (Vol. I, p.26). This comment was verified in a study recently released by the Office of Technology Assessment, which stated that "Environmental research and baseline studies are not formally coordinated in the Interior Department's leasing schedule and there is no requirement that information gathered be used in the decision making process for sale of offshore lands and subsequent operation." Office of Technology Assessment, U.S. Congress, Nov. 1976, p.60.

Although the BLM may, at some point in time, meet the second objective of detecting "the impact of OCS oil and gas exploration and development on the marine environment," (Vol. I, p.26) this knowledge will prove useless if the leases are granted with no termination clause.

Of concern in the description of the Environmental Studies Program is the omission of studies to determine the impact of hydrocarbons on different components of the natural environment. Such studies should examine both the effects of chronic and acute hydrocarbon pollution on marine organisms. Without knowing the susceptibility of different organisms, it is difficult to determine what measures may be required for mitigation.

The studies are described as measurements of isolated physical and biological characteristics of the marine environment not of ecosystem components. There is no discussion as to how this information will be used in an analysis of the susceptibility of the entire ecosystem to hydrocarbon pollution or to the increase of toxic substances in the ecosystem. As ecosystem components are interrelated, the particulars of one organism's susceptibility is only of partial use.

Furthermore, many marine organisms are already under stress from chemical pollutants discharged into the ocean. As Dr. John W. Farrington of the Woods Hole Oceanographic Institute pointed out at the BLM's December 7, 1976 hearing, the DES "ignores the question of the synergistic interactions of OCS drilling and production pollution with other pollutant stresses on the Georges Bank."

I.E. Relationship to Other Governmental Programs

1. Federal

This section, after its description of the regulatory authorities of federal agencies which will be required by this program, does nothing to suggest how these programs may be combined to allow a comprehensive evaluation of an exploration or development proposal. The present arrangement is for different federal agencies to grant permits on separate parts of the program: BLM grants the lease; the Corps of Engineers issues permits for the structures; the Coast Guard issues permits for safety and navigational devices on the offshore structures; U.S.G.S. issues the actual drilling permits; EPA permits the discharges; and the Office of Pipeline Safety regulates

pipeline corridors. These and other federal agencies regulate onshore facilities related to offshore development. The existing regulatory scheme is fragmented, and uncoordinated. As presently constituted there is no mechanism to assure that these programs will be operated so as to significantly mitigate cumulative impacts generated by offshore exploration and development, transport of the oil and gas ashore, transport, processing onshore and related secondary development.

2. State

The DES discussion of the state programs related to the offshore lease sale is erroneous and not sufficiently detailed. Furthermore, the DES does not mention the authorities of the states over the subsea region out to the three mile limit. In detailing state programs which would affect OCS operations, the DES fails to discuss how state programs may frustrate or alter the OCS operations outlined in Section I of the DES. Certainly, California's decision to block the unloading of tankers carrying North Slope Oil, is an example of this.

The information on the status of state coastal zone management programs under the Federal Coastal Zone Management Act is incorrect. At a November 22, 1976 public meeting in Boston, Massachusetts, Kathy Cousins of OCZM noted substantially different approval schedules for state programs. She indicated that new Jersey, Rhode Island and Massachusetts would submit programs to NOAA in the summer of 1977. However, it takes almost a year to go through the EIS and approval process. The DES assumes that OCS exploration and development will occur after states have approved CZM plans. That assumption is not viable, especially for New York State,

which does not intend to submit a plan before 1979. Onshore facilities may follow a major strike which could occur within one year of a lease sale. This would precede actual development. Erroneous information is included in this section:

Vol. I, p.47 - The Department of Environmental Conservation is not the lead agency in New York's CZM program.

Vol. II, p. 48 - The New Jersey Coastal Area Facility Review Act does not "protect all coastal areas." It has a limited boundary, and excludes those areas of the New York Bight and Delaware River where refineries presently exist. In addition, the CAFRA program does not yet have an energy facility siting component.

Vol. I, p. 49 - the New York State Environmental Quality Review Act did not take effect June 1, 1976, as it was amended in the 1976 legislative session.

Air quality requirements of federal legislation are described (Section 1E,2c) but the status of these requirements' implementation in the North and Mid-Atlantic states is not given. This is especially significant, as siting of the refineries or gas processing plants may be affected by the necessity for compliance with federal and state plans.

3. Oil Spill Containment and Cleanup

Operating Order No. 7, which includes the requirements put on the drilling operations for taking care of oil spills, only covers the requirement of oil spill equipment, and requires the leasees to develop an oil spill contingency plan. At present, there is no comprehensive federal legislation establishing oil spill liability,

and state oil spill liability schemes are not adequate in New Jersey or New York at the present time. The OTA study (November 1976) indicates that Operating Order No. 7 is inadequate as "there is no assurance that the technology utilized in the Baltimore Canyon Trough or in any other frontier region would be adequate for oil spill surveillance, containment and cleanup." (p.57) and further, that

> "[t]he present capability to deploy effective high seas removal equipment is limited by the availability of such equipment and the ability to deliver the equipment on scene." (p.58).

The OTA's determination appears valid in light of the Coast Guard's frustrated attempts to contain the oil spilled from the tanker "Argo Merchant". High seas and poor weather prevented unloading and containment attempts. There is no indication that a similar situation arising from OCS Sale 42 could be prevented.

The assertions made in this section of the DES on the capability of technology and equipment to handle oil spills are clearly wrong. It is evident that existing technology cannot control spills in heavy seas, and that the Georges Bank marine resources will be seriously threatened if the OCS leasing program continues in its present unplanned way.

III. Impact on the Environment

A. Basic Assumptions Regarding Causes of Offshore Environmental Impacts

5. Oil Spill Trajectories in the North Atlantic Region

The major problem with this section is evident in the title - the exclusion of an examination of spill probability in the Mid-Atlantic region, particularly the Long Island coastline and the

New York Bight. As Sale 42 is expected to result in transport of oil by tanker to the Mid-Atlantic, the tanker route must be used as a basis for the trajectory analysis. The analysis is limited by its assumption that the Georges Bank lease area would be the only point source of a spill. (Figures III 11-14, Vol. II, pp. 686-689). Spills or leaks from the oil's mode of transport, whether pipeline or tanker, must receive consideration in this analysis. It is inadequate to consider the OCS Oil Spill Risk (Vol. II, p. 681) without considering the trajectory that spilled oil might take from a tanker or pipeline.

C. Fisheries

To adequately evaluate the DES' analysis of fisheries, it was necessary to review Sections II-F,G, III-C,D,E and Sections IV, V, VI and VII. The information contained therein indicates that Georges Bank has one of the most productive fisheries in the world (Vol. I, p. 461), that little information is available about the distribution and population levels of fish in this area; and that oil pollution could seriously impact this resource. (Vol. III, p.1224). This information merits serious consideration as to whether it is viable federal policy to jeopardize such a significant resource for a limited amount of oil and gas.

The lack of specificity about the present and potential contribution of the Georges Bank fishery to the protein food supply of New England and the United States is inexcusable. Sections VI and VII, discussing Short and Long Term Uses of Man's Environment and Irreversible and Irretrievable Commitment of Resources, do not produce this kind of information. This omission makes it virtually

impossible for the Secretary of the Interior to adequately assess the trade-offs of producing an oil and gas supply for a limited number of years as against the long term productivity of fisheries resources which would help meet the United States' and world food needs.

There are specific problems contained in the DES' approach to the fisheries resource. There is no adequate consideration of the new 200 mile limit which would include Georges Bank. Furthermore, there is no accounting of how acres lost to both oil and gas development, and to the Canada 200 mile limit might effect the total area available to United States commercial fishermen. Furthermore, there is no quantification of the catch lost by diminishing a fishing area, or how large an economic loss this would be to the New England region.

The DES admits that little information is available concerning the distribution of pelagic fishes," (Vol. I, p. 335), that little is known about "the toxicity of trace metals or other chemicals as they are represented in drilling muds," (Vol. II, p. 798) that the impact from the discharge of formation waters is not known (Vol. II, p.863), and that "there would also be an unknown amount of long term degradation of the environment." (Vol. III, p.1224).

With so little known about the degree of impacts on the off and near shore fisheries, it would be necessary for mitigating measures to be taken to ensure the protection of this valuable resource. However, upon review of mitigating measures (Section IV), it appears that the resource remains unprotected.

Stipulations 2, 3 and 4, which are intended to protect fragile natural systems, are not yet written. The DES indicates that these will be available for federal and state review, when

completed, but does not indicate that they will be available for public review. It is necessary for the DES to contain the exact language of these stipulations, so as to allow maximum public comment. The OTA study's statement that "states cannot participate in a meaningful way in the process that leads to major leasing and OCS decisions under present policies." (OTA, November 1976, p.17) is verified in the procedure which allows the development of stipulations after the NEPA process has been completed.

To conclude, the DES lays out the known information on the fisheries resource, but it does not adequately detail the extent of trade-offs between the renewable fish resource and short term energy development. The information contained in the DES is inadequate in this regard and therefore, does not provide the Secretary of the Interior with the information necessary for an informed and wise decision.

III. E. Onshore Impacts of Oil & Gas Operations

This section of the DES raises questions about the reliability of Technical Paper 2, of the adequacy of the consideration of impacts from the North Atlantic Sale on the Mid-Atlantic region, and on the BLM's analysis of the North Atlantic Region.

Technical Paper 2, used as the basis for this Section, is a study of the "North Atlantic Coastal Region," and its economic characteristics. It is unclear, in this section, what are the boundaries of the "North Atlantic Coastal Region." Because the region is not defined, it is difficult to determine the reliability of the employment multiplier, or the study's information on economic impact.

The Section, "Induced Industrial Effect," contains an analysis on Petroleum Refining (Vol. II, p. 903), which states that that oil discovered in Georges Bank will be refined in the Mid-Atlantic Region, and, therefore, that the impacts from Sale 42 could be greater on the Mid-Atlantic states than on New England, (Vol. II, p. 904). However, these impacts are not fully described, as was pointed out in NRDC's testimony at BLM's Public Hearing, held in Boston on December 7.

The text describing Induced Industrial Effects is troublesome as it is almost identical to that in the Sale 40 EIS. The Section beginning with 5. Rubber and Miscellaneous Plastics Products, (Vol. II, p. 913), and ending with 18. Fishing, Hunting and Trapping (Vol. II, p. 921), is virtually identical to the same sections in the Sale 40 EIS. Because of the similarity of the two texts and the vagueness with which New England is treated, one wonders whether Technical Paper 2 provides any useful information pertinent to the New England region, or even if the Paper was used in the DES, as indicated on p. 895, Vol. II.

It is improbable that the information in the DES can be used by local governments in New England to plan for induced industries, as 1) the region which this information covers is not defined, and 2) there is nothing to indicate that the specifics of New England coastal communities were used in this analysis. The imapct of induced industries on the tourist and commercial fisheries economies is not adequately discussed or detailed. The discussion of the petrochemical industry, the industry most likely to locate in New England as a result of this Sale, is inadequate. Robert Armstrong,

of the Texas Land Office, indicates that the petrochemical industry moved to the Gulf Coast to locate close to the supply of natural gas. */ This is likely to happen onshore of any significant fields of natural gas.

C. Land Use

As stated in NRDC's oral testimony on December 7, 1976, the land use estimates in this DES are four times those of the Mid-Atlantic Sale. The reason why the same facilities in these two regions require substantially different acreages is unclear. This is especially curious as the oil and gas projections for the Baltimore Canyon are greather than those for the Georges Bank, and furthermore, the North Atlantic figures exclude refineries. If the North Atlantic figures are correct, the Sale 40 EIS was clearly a misleading and erroneous document.

D. Recreation

This section indicates that beaches and other recreation resources may be affected by oil spills, and identifies the general locations of those beaches. However,the DES does little to identify the significance of those impacts to the tourist economies to Long Island and Cape Cod, both extremely fragile coastal areas. The fact that beaches may be polluted by oil does not provide the information necessary for the Secretary of the Interior or the general public to assess what the long term negative impacts may be to the tourist economy or the coastal fishery which provide

*/ Onshore Impacts Conference, Executive Summary, Sponsored by the Georgia Conservancy and the Georgia Coastal Zone Management Program, May, 1976, p.5.

substantial income to these two regions.

2. Impact on the Natural Environment

This section fails to outline the extent of environmental impacts on wetlands, estuaries, and barrier islands, despite the fact that these coastal resources represent some of the most fragile and productive of ecosystems in the natural environment. Nor, are the possible economic impacts from loss of productivity of these resources detailed or quantified.

Although the DES recognizes that coastal resources may be disturbed by oil spills, pipeline laying, and construction, it attempts to minimize these impacts. For instance, the DES states that Long Island salt marshes will not be adversely affected by oil spills, since the marshes will be protected by barrier islands and beaches. Although we disagree with this statement, it points out the DES' tendency to write off the protection of the resource, the barrier island, in order to protect another, the salt marsh. This is particularly insupportable in light of the value of the barrier island system to the Atlantic Coast. The DES minimizes this value, by discussing the barrier island system in the terms of separate vegetative components. Barrier islands and beaches are fragile ecosystems made up of various elements which interact with each other. If one element, such as the dune vegetation, is destroyed, the whole system can be affected. The DES's approach to impacts to coastal resources is fragmented, totally neglecting the interrelationship of each component with one another.

F. Air Quality

The information contained in this section, that Northern

New Jersey would have a 30% increase in HC and SO_x above present levels is deeply disturbing (Vol. II, p. 1069). In view of this possibility, the DES should discuss the impact to the leasing program of a decision by EPA or a state to prohibit a new or expanded refinery, or a gas processing plant, because air quality standards will be exceeded. The DES should examine the alternative refinery and gas processing locations available to producers in the Mid-Atlantic regions.

I. Cumulative Impacts

This section exemplifies the problems arising out of BLM's approach to its NEPA responsibilities. This DES is geared to explaining the impacts resulting from Sale 42. The Secretary of the Interior is to decide whether or not to hold the sale, using this as a decision document. The states and localities are to plan for the impacts, also using the DES as a guide. However, the DES is misleading in that it isolates the impacts of this sale from those of all other sales in the Atlantic Coast. The DES must evaluate all potential impacts on the North Atlantic coastal region from OCS activity on Georges Bank, from this sale and other sales in the North Atlantic . Also critical is a full analysis of the cumulative impacts of lease sale and lease Sale 40 on the Mid-Atlantic, since the onshore impacts from both these Sales are to fall heaviest on the Mid-Atlantic region. By isolating the impact discussion from the various sales, the Bureau of Land Management delays disclosure of the full range of cumulative impacts until it becomes too late to avert these impacts.

This section of the DES which is supposed to deal with this, does so inadequately. Some of the key issues not addressed by this

section of the DES are:

1. Will it be possible to expand refineries in New Jersey if the HC and SO_x will increase as much as 30% (Vol. II, p. 1113)?

2. How would tankers be unloaded in the Mid-Atlantic region?

3. What percentage of jobs generated by this sale will be taken up by specialized workers brought into the area?

4. Finally, how can additional impacts on biological communities be determined without baseline information against which new levels can be compared to determine size of change?

IV. Mitigating Measures

A. Department of Interior Regulations and Enforcement

The Department of the Interior's regulatory powers are divided between the Bureau of Land Management's lease stipulations and the Geological Survey's regulations and Operating Orders. Because the BLM and USGS are in different divisions within the Interior Department, their actions cannot be adequately coordinated. This division of functions within the Interior Department should be eliminated so as to better coordinate the OCS leasing program.

1. BLM

Section IV D discusses special stipulations for Sale 42. Unfortunately, they are not the actual stipulations but termed"possible." There are no assurances that these will be used.

Stipulation No. 1, concerned with Cultural Resources, will allow the Supervisor the choice of invoking the stipulation when he considers it necessary, because a cultural resource has been identified. Unfortunately,

irreparable damage could result before it is invoked.

Stipulation No. 2, on Biologically Important Areas, is again at the discretion of the Supervisor. It fails to define what constitutes a biologically important area. Included should be highly productive as well as unique and fragile areas.

Stipulation 4, Transport of Oil, suggests that pipelines be used "if technically and economically feasible." This same phrase is used in requiring the burial of pipelines. It is inexcusable, in a highly productive and fragile natural area, to let the economic situation of the leasee determine whether or not an environmental safeguard is required. Pipelines must be required and must be buried. Burial should be to a depth suitable to protect thepipeline from sediment movement, and fisheries trawling gear.

Stipulation No. 5 requires that directly affected states receive Notice of Exploration Plans. The Notice is not, however, the Exploration Plan. NRDC suggests that this stipulation require that the states receive the Plan itself, and that it also be made available to the public. In addition to requiring inclusion of information pertaining to the leasee and its contractors, it should require inclusion in the plan of leasees' subcontractors.

There is no mention of a stipulation which allows termination of a lease if an adverse environmental impact occurred, or if a fragile and productive natural areas were identified where impacts could not be minimized. Such a stipulation should be included.

2. U.S.G.S.

Although the Operating Orders are intended to place environmental safeguards on the program, many of these orders have not been finalized. Because the Secretary of the Interior must make a decision as to whether or not to hold the sale, he must have information concerning what mitigating measures will be employed and how they will affect potential impacts. It is essential, therefore, to include the final text of the Operating Orders for Sale 42 in the final environmental impact statement.

The Operating Orders outline how the leasees will be required to use certain technologies in their operations. Of particular concern is the adequacy of Operating Order #7, which is intended to control pollution of the marine environment. This Order does not require that Best Available Technology (BAT) be utilized. This is essential if the marine environment is to be protected. Moreover, there is a serious question concerning the adequacy of existing technology for containment and cleanup of a North Atlantic spill. (OTA Study, November 1976, p.57). OTA's critique is highlighted dramatically by the handling of the massive oil spill on the Nantucket shoals. The inadequate containment mechanism raises serious questions about the technological capability of controlling spills in the North Atlantic.

The discussion of oil containment and cleanup discusses the use of synthetic sorbents, and "various chemicals." There is no information as to the toxic effects of these materials on marine organisms.

Finally, the USGS will have an inspection and enforcement program (Vol. II, p. 1155). However, there is no discussion of the frequency of inspections, the number of personnel involved, or any assurances that an enforcement program will be strictly followed.

A major deficiency in the Section on Mitigating Measures is its omission of discussing any measures which are not under the direct responsibility of the Interior Department. This is especially significant in the areas of onshore impacts such as land and water use, and their subsequent impacts on air and water quality, population trends, and regional economies. These are areas under the regulatory authorities of other federal and state agencies. For example, this section fails to discuss mitigation through coordination of federal permitting.

Furthermore, this section does not discuss existing state regulatory procedures and their impact on the OCS activities. These regulations can be used to frustrate the BLM's proposed activities if onshore facilities and pipeline landings are severely restricted. In addition this section does not discuss what additional state measures are needed to ensure mitigation. Two general areas that states need additional jurisdiction over are oil spill liability and pipeline routing out to the three mile limit.

V. Adverse Impacts

A. Marine Organisms

It is clear that adverse impacts on marine organisms are unavoidable, as stated in the DES (Vol. III, p. 1193). However, without the results from baseline studies, there is no way that the impacts of acute or chronic oil contamination, of drill cuttings,

and of formation waters, can be assessed at this time. Because these adverse impacts cannot be detailed, Sale 42 should be delayed until the studies have been completed. As an alternative, a cancellation provision should be included in the leases.

B. and C. Vegetation and Wetlands

"Salt marshes will suffer a minimal amount of damage as a result of an oil spill." (Vol. III, p. 1198). What support exists for this statement ? The extent of damage depends on the location of the spill. Transporting the oil by tanker to the Mid-Atlantic makes marshes from Massachusetts to New Jersey susceptible to varying degrees of contamination. The impact statement evaluates these impacts inadequately and furthermore treats salt marshes and wetlands as two different subjects (Section B, Salt marshes, Section C, Wetlands).

E. Air Quality

The section discusses the major increases expected in SO_x and HC emissions as a result of this sale. However, it does not discuss what the resultant impacts of these increases are in regard to public health and agricultural damage. The impact of poor air quality is not the amount of the substance in the air, but how that amount affects living organisms. This interrelationship is neglected throughout the DES.

F. Land Use

The DES is deficient by its omission of land use impacts, both primary and secondary, in the Northern New Jersey region resulting from Sale 42. Because the oil will be transported to

Mid-Atlantic refineries, the Mid-Atlantic states deserve consideration in this DES comparable to that of the North Atlantic. The discussion in the Cumulative Impact Section is inadequate.

H. Recreation

The discussion of recreation impacts neglects to mention how adverse impacts on a recreational facility could seriously affect the regional economies of Cape Cod, the Islands, Long Island and the New Jersey shore. These regions provide a recreation industry which is a major portion of their state's economies. The relationship of recreation to state economies is never adequately quantified in the DES.

I. Commercial and Sports Fisheries

As in the above section, this section does not relate losses of commercial and sports fishing grounds to economic losses to the regional economies. Maintaining environmental quality of marine resources is a requirement of a viable fishing industry. However, this discussion does little to document the relationship. Instead, it discusses losses of acreage because of displacement by physical apparatus.

To conclude, adverse impacts on the environment are discussed only in generalities. Beyond stating that resources may be affected by oil spills, a fact one hardly needs a 3-volume impact statement to document, there are no specific impacts noted.

VIII. Alternatives to the Proposed Action

A. Hold the Sale in a Modified Form

1. Delete Tracts

If the sale is held, we support Proposal d., which deletes those tracts having the potential to affect wintering bird populations, and commercial fishing areas and which pose a greater threat of onshore impacts from oil spills.

2. Substitute Tracts.

Because little information is available on the offshore marine environment, there is no overriding reason to substitute one set of tracts for another. Perhaps after the baseline studies are completed, it would be possible to make such a judgment.

B. Delay the Proposed Sale

As NRDC has stated repeatedly, we support delaying all OCS sales until state Coastal Zone Management programs and environmental baseline studies have been completed. The DES does not adequately evaluate these alternatives. The DES reasons that all North Atlantic states will submit plans by September 1977, and that Rhode Island's Plan would be implemented in 1976. All plans take at least 8 months for approval after submission, so the submittal date does not make any difference. Rhode Island has withdrawn its submission, and it would not be expected to have an accepted program before 1978. Onshore activities from an OCS lease begin as soon as the leases are sold, not waiting until exploration and development are in full swing.

NRDC supports delay "Pending Development of New Equipment to Provide Increased Environmental Protection," Proposal 3. It is clear from the Coast Guard's inability to contain the Argo Merchant spill, that existing equipment is not operable in the North Atlantic Region in adverse weather conditions.

NRDC supports delay pending enactment of a federal oil spill liability plan, Proposal 4.

The DES omits a proposal to delay the sale pending the adoption of a federal energy policy, and a description of how Sale 42 fits into the national and regional energy supply program.

C. Withdraw the Proposed Sale

D. Alternate OCS Leasing Area

E. Alternatives Within the Proposed Actions

The discussion in these three sections of the DES is virtually identical to that in the Sale 40 Environmental Impact Statement, Volume II, Sections C, D and E. There are minor word and number changes, but no changes in substance. This is a clear indication that the Department of the Interior, and indeed, the federal government, has not advanced its approach to a national energy program in the last 8 months. Rather than respond to the BLM's same language, we resubmit that portion of NRDC's comments on Sale 40 which pertain to these sections, and to subjects which were not considered in the discussion.

COMMENTS SUBMITTED BY NRDC ON OCS SALE 40 DRAFT ENVIRONMENTAL IMPACT STATEMENT

C. Withdrawal of Sale

1. Energy Conservation

The DES' conclusions regarding the alternative of energy conservation are not supported by figures or statistics.

The cause of energy dependence is not the decline of energy supplies but staggering increases in per capita energy consumption (doubling every decade since World War II). Energy conservation -- including the elimination of wasteful energy distribution as well as consumption patterns -- can potentially do far more than OCS drilling to achieve energy dependence goals both in the short and long run.

Energy conservation would result in more efficient use of existing energy sources and energy resources, would preserve and extend domestic production capability and would make possible a smooth transition, with minimum environmental consequences, to a non-fossil fuel energy system.

Assuming that maximum average estimated production of 285,000 bbl/day (DES II-11) and 1 billion CF (9.4 TCF divided by 9,125 days) is achieved,* this production level is the equivalent of 1,687,250 $x10^6$ BTU daily production. On a basis of 10,000 BTU/KW, this total works out to about 268,725,000 KW of daily production. If British experience

*The DES uses the higher (January '75) USGS estimate of recoverable reserves in comparing quantities of energy required. This is misleading because these estimates have been repudiated by USGS and much lower ones substituted. While retaining the higher estimate for purpose of tracking with the DES' comparisons, the results in these comments should be reduced by at least one-third in the case of both oil and gas to track with the revised estimates (DES, Vol. 1, p. 1).

in a comparable field is correct, development will cost $1 billion. (N.Y. Times 9/14/75 p. 10).

There is no reason to think that this amount of energy could not be saved at the present time under available technologies. The Energy Policy Project of the Ford Foundation estimated last year that 24.2 Quadrillion BTU could be saved by 1985 with relatively minor measures of conservation in residential, commercial transport and industrial sectors; it estimated that the same measures could achieve savings triple that amount by 2000.* The following methods have been demonstrated:

- energy conservation practices in existing commercial buildings would save a fourth of energy now used for heating and cooling through insulation, double-glazing, etc., at a cost that will repay itself in four years. A more complete system that would repay itself in less than a decade would save 40% of energy so used;**

- energy conservation practices in new commercial buildings would save half of energy costs and repay themselves in five years;***

- energy conservation practices such as installation of storm windows, insulation, and setback of thermostats at night would save a 35-40% of energy costs and repays itself in less than a decade;****

- energy conservation by use of total energy systems which generate heat and power simultaneously saves twenty to forty percent of energy consumed and, in new buildings, would pay itself back in less than a decade;

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*Energy Policy Project of the Ford Coundation, 1974, A Time to Choose, p. 45.

**Oral Communication, Dubin, Mindell & Bloome, Inc., Engineering Consultants, N.Y. N.Y.

***Ibid

****Ibid

*****Ibid

- energy conservation by retrofitting old oil-fired steam power plants with gas turbines at average cost probably $150-200/KW. Such retrofitting would increase fuel efficiency of the plant from the present 25-30% to 32-37%.

2. Conventional Oil and Gas Supplies

The DES makes no effort to discuss the impact of changing prices for oil and gas, or the impact of price deregulation, on secondary and tertiary recovery of oil and gas. Such recovery is highly elastic. Changing price levels will result in increased rates of U.S. production so as to reduce any imagined need to produce frontier areas at this time. Secondary and tertiary production is now taking place. (N.Y. Times, 12/15/75, p.31) It has been estimated that an increase of 1% in recovery rate would produce an extra four million barrels; and the BLM has estimated that such production could increase recovery by 10 billion barrels by 1977-1979. (Congressional Quarterly, 6/8/74, p. 1465).

As far as overall oil and gas supply is concerned the assumption that increased U.S. production can result in any meaningful lessening of "dependence" on foreign oil is belied by independent studies of future import levels.

A recent Library of Congress study has concluded that the goals of Project Independence are unattainable. (N.Y. Times, 12/25/75.

Similarly, a study by A.D. Little to assess the feasibility for power generation of electric utility fuel cells for Electric Power Research Institute concluded, in its final report, that

> "even with...fairly conservative growth rates in oil demand...we foresee imports to be 40% and 35% of total demand in 1980 and 1985, respectively." *

The report predicts that oil imports will rise to 7.9. million barrels/day by 1985, at 2-18, and that, for instance, residual fuel oil would cost between $2.30 and $2.82 in 1985 and would average $2.40 per barrel by 1990, at 2-3.

7. Solar Energy

The DES inadequately describes the attractions of solar energy as an alternative to OCS leasing. Solar energy will, as the DES recognizes, "be available in a significant scale in 10 to 15 years". (DES II-444) The DES makes no effort to evaluate the energy costs of exploiting solar energy as opposed to exploiting OCS oil and gas, or to assess the potential for accelerated solar energy development as an alternative to such development. Solar energy for heating and cooling could result in considerable fuel savings by retrofitting flat-topped commercial buildings in the Northeast with solar panels. Individual homes can install solar water heating units, and directly reduce fuel consumption, at a cost of $2,000 per home.

*EPRI, Assessment of Fuels for Power Generation by Electric Utility Fuel Cells, A.D. Little, Oct. 1975, at 2-16.

8. Oil Imports

The DES fails to provide any documentation that the sale will affect imports of oil, yet the sale is justified repeatedly on the basis that it will take the place of oil that would otherwise be imported. This cannot be accepted without documentation as to the price of oil, the nature of the oil, and the expected demand pattern for oil. None of these figures are supplied by the DES. As was pointed out above, two recent studies have concluded that oil imports cannot or will not be reduced in the foreseeable future.

12. Other Energy Sources

The DES fails to discuss some of the most hopeful of the alternative energy sources

- wind generation

  ERDA will demonstrate a 1.5 MW wind generator by 1980.

- OTEC plants (ocean-thermal)

  OTEC plants involve the same technology as drilling platforms. A demonstration 100 MW plant is planned for 1985 to cost $500 million Estimated cost is $2500/KW as opposed to $3700/KW for OCS drilling.

- waste conversion

  The burning of waste may be one of the most significant potential sources of energy. The Connecticut Resource Recovery Authority has already commenced work in this area.

D. Alternative OCS Leasing Areas

The DES unwarrantably avoids any discussion of the desirability of a ranking of lease sales on a scale of

environmental impact.

It is clear that the guiding principle in the Program is not protection of the environment but the immediate exploitation of the most lucrative fields. The DES allows the short-term consideration of cost effective deployment of production platforms to override an environmetnal cost effectiveness calculation. The BLM thus belies its own invitation to the public and to other agencies to suggest rankings to govern the decision to lease. Contrary to the DES(II-463) environmental impacts are not invariant with area: they will differ profoundly with the temperature of the water, sea-state, nature of the coastal habitat bordering the base area.

E. Alternatives within the Proposed Action

1. Government Exploration Prior to Leasing

The discussion of this alternative is seriously deficient. No attempt is made to trade off the actual potential cost against the value of the information derived. The conclusory statement concerning the "cost effectiveness" of the present system is totally without documentation. There is no discussion of government taking a part-interest in an exploratory effort. There is no discussion of the historical relation between estimated production and actual production so as to determine whether there is any need for better information. There is no discussion of a complimentary reform, i.e., requiring companies to provide so-called "proprietary" information

concerning potential reserves in the bidding process. The companies can have no valid reason to object to providing such information to the government as lessor. The government is in fact participating in an exploratory effort at the present time. (N.Y. Times 12/12/75)

2. State Participation in Decisions

This alternative, involving a suspension period between exploration and development, is inadequately discussed. No description is provided of what kind of "participation" is contemplated: whether suspension periods could be further extended by the states; whether locally affected communities would "participate"; whether and in what form criticisms of proposed company actions by states would be incorporated into leasing decisions; what the purported "costs [of delay]...passed on to the consumer" would be; whether unitization, described in terms of resource conservation, should not also be mandated on environmental protection grounds; what the nature and scope of a broadened - and not yet existent - "development plan" would be. A decision to proceed with a sale on the ground that future environmental safeguards might be established - seems to frustrate the intent of NEPA that a unified assessment of environmental consequences be made before major federal actions are taken.

II. Alternatives Not Discussed in the DES

A. Variations in Bidding Procedure

Different forms of bidding should have been discussed

since different forms, such as those proposed in HR 6218, would have different effects on the extent to which full recovery of reserves is assured. In turn, the extent of recovery would have environmental effects as more or less oil or gas would be produced.

Among the forms of bid described in HR 6218 are included:

- cash bonus with fixed royalty;
- variable royalty with cash bonus;
- diminishing or sliding royalty changing with amount of remaining reserve, with cash bonus;
- cash bonus with reservation of fixed share of net profits to U.S.;
- cash bonus with variable reservation of share of net profits to U.S.;
- cash bonus with royalty and percentage of net profits;
- competitive performance bid.

B. Lease provisions: A lease termination clause.

Of the many provisions which might be included in a lease or in regulations, a provision allowing the Secretary to terminate the lease on environmental grounds is essential. This alternative should have been discussed in the DES.

Its importance is manifest: it allows the Secretary to prevent a situation which has been recognized as being environmentally destructive from continuing and perhaps worsening. It removes from the lessee the necessity of deciding between continued profit and environmental risk or damage.

The Programmatic Program Decision Option Document (PPDOD) maintains that the Interior Department has no authority to adopt a provision for the termination of a lease. This assumption has been continually refuted by environmentalists, and should be carefully examined in this Draft Environmental Statemen..

C. Variations in Percentage of Government Take

There is no reason why the government share of revenues or profit should remain as low as it historically has been. A higher government revenue component could help to finance environmental protection or alleviate the socio-economic effects of drilling at the state and local level.

The British government's total revenue derived from oil development in the North Sea is 73% of the value of the oil, a large part of which is comprised of a tax of 45% on oil revenues, apart from royalty and corporate income tax. (N.Y. Times 9/14/74, p.10) The tax has not resulted in failure to develop the North Sea reserves. There can be no reason to not consider the desirability of similar revenue measures in regard to Atlantic production.

REPORT TO THE CONGRESS

Vessel Traffic Systems--What Is Needed To Prevent And Reduce Vessel Accidents?

U.S. Coast Guard

Department of Transportation

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

RED-75-319

JAN. 21, 1975

25 FEB 1976

DEPARTMENT OF TRANSPORTATION
STATEMENT ON GAO REPORT

I. TITLE: REPORT TO THE CONGRESS OF THE UNITED STATES

VESSEL TRAFFIC SYSTEMS--

WHAT IS NEEDED TO PREVENT AND REDUCE VESSEL ACCIDENTS?

II. GAO FINDINGS AND RECOMMENDATIONS

It is the conclusion of the GAO Report that the vessel traffic system (VTS) program should be redirected in order to produce maximum benefit in reducing loss of life, injuries, and damage to property and the environment caused by vessel collisions, rammings, and groundings. On the basis of system acquisition and construction costs, GAO has classified the various levels of VTS into two categories: "basic" and "sophisticated." "Basic" systems include regulations, traffic separation and routing schemes, and vessel movement reporting communications systems (VMRS). Systems which utilize electronic surveillance or automated equipment have been termed "sophisticated."

GAO considers that greater incremental benefits can be gained from the development of "basic" systems in many ports and waterways than from the addition of "sophisticated" system elements in the major port areas presently under development. The GAO Report contends that the Coast Guard should follow a strict phased approach in all ports and waterways by first operating and evaluating the effectiveness of basic systems before adding increased system capabilities, such as surveillance or automation.

The Report recommends that plans to add surveillance capabilities in Houston/Galveston, New Orleans, and sections of New York be deferred until "basic" systems have been developed in several other U. S. ports and waterways. Additionally, GAO has concluded that expanded efforts in establishing regulations under the Ports and Waterways Safety Act of 1972 are required. It is recommended that national emphasis and direction be given to establishing regulations including vessel speed limits, limiting the size of tows, and regulating the movement of vessels carrying dangerous, combustible and polluting cargoes.

III. DOT COMMENTS ON FINDINGS AND RECOMMENDATIONS

In order to assess accurately the direction of the vessel traffic system program, clarification of two points which form the basis of the GAO Report is essential.

A misconception of the trend of costs for VTS levels appears in the GAO Report, inasmuch as only acquisition and construction costs are quoted. For a more complete analysis of system costs, annual operating expenses, such as personnel salaries, which comprise a substantial component of total costs, must also be taken into account. All Coast Guard decisions concerning the selection of VTS levels for the areas under development have been based upon an analysis of total system costs and benefits. Appendix A provides detailed cost information for both initial construction and annual operating costs by system and level. Analysis of total costs rather than just initial costs provides more comprehensive information for decision making purposes.

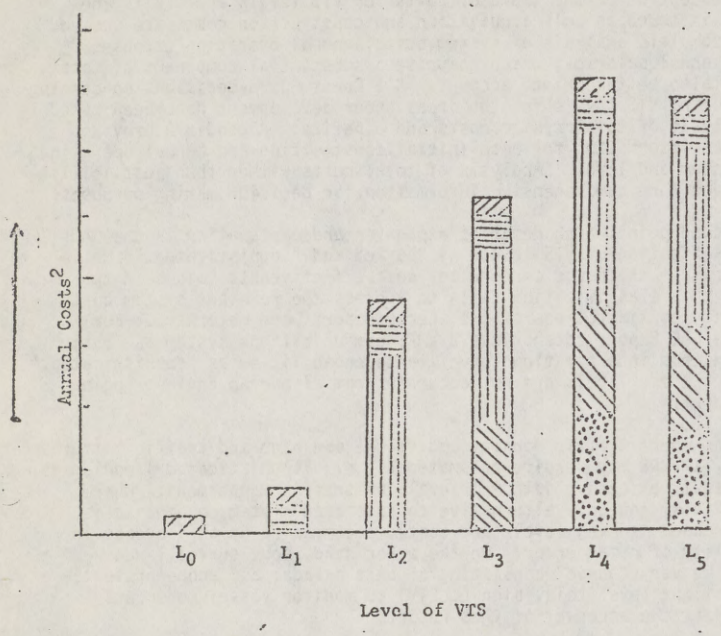
The second point which deserves expansion and explanation is the GAO Report classification of VTS levels as "basic" and "sophisticated." While there is merit in the basic concern for cost effectiveness voiced in the GAO Report, this classification fails to address the relevant system cost and complexity considerations of the specific ports and waterways. For example, the GAO Report categorizes a VMRS communications system as "basic" and those systems incorporating surveillance capabilities as "sophisticated." In many cases these labels are not accurate from either an engineering or cost standpoint.

In areas where traffic density and volume are high and traffic patterns complicated, a VMRS may require automated (i. e., "sophisticated") equipment to provide fast, effective data retrieval for traffic management. Where this need exists, the only alternative to automated system components is greatly increased manning level (and cost), accompanied by an increase in the probability of human error. On the other hand, some surveillance systems may be very "basic" consisting of only a radar and scope presentation or low light level television (LLLTV) to monitor vessel movements and to validate the accuracy of VMRS reports.

The GAO Report's classification of VTS levels is also inappropriate on the basis of total system costs. The following bar graph, from an earlier Coast Guard Study Report, depicts the general trend of annual costs by VTS level for the "typical" VTS. The cost figures in the bar graph are based on a hypothetical VTS in which all levels are employed, with three to four remote communications sites and two to three remote radar sites. Annual costs were computed by adding annual operating expenses to the initial implementation costs divided by 15 years. The figure of 15 years, estimated to be the expected life of each system, may be subject to argument, but this figure is considered valid since the costs of equipment replacement are included in annual costs.

General Trend of Annual Costs
Versus
VTS Level[1]

Graph assumes hypothetical VTS in which all VTS levels can be used.



[1]Definition of Levels and Legend of costs

L_0- Vessel Bridge to Bridge Radiotelephone . . .

L_1- Traffic Separation Scheme . . . . . .

L_2- Vessel Movement Reporting System . . . . . .

L_3- Basic Surveillance . . . . . .

L_4- Advanced Surveillance. . . . . .

L_5- Automated Advanced Surveillance. . . . . N/A

[2]Annual cost is defined as the construction cost divided by fifteen years plus the annual operating costs. Costs are based on actual costs for Puget Sound (Phase I) and San Francisco, and on estimated costs for Houston-Galveston and New Orleans (Phase I).

As portrayed by the bar graph, the most dramatic increase in annual costs occurs in moving from a traffic separation scheme to a vessel movement reporting system (VMRS). The establishment of a VMRS involves the construction and outfitting of a vessel traffic center, remote communications sites in most cases and extensive personnel costs for continuous watchstanding and operation. Comparatively, the cost increase in adding surveillance capabilities is smaller. The initial capital outlay for surveillance, relay, and display equipment may seem substantial, but little or no annual operating personnel costs are incurred.

After close examination of costs by VTS levels, it is considered that the classification of VTS levels as "basic" and "sophisticated" is inappropriate. Possibly, a more meaningful classification, on the basis of system complexity and costs, would be "manned" and "unmanned" systems.

With these clarifications of the general trend of VTS costs and of the classification of VTS levels, attention is directed to the GAO Report's "RECOMMENDATIONS TO THE SECRETARY OF TRANSPORTATION." Each of the four recommendations is discussed in detail below.

RECOMMENDATION 1: "--redirect its traffic program to emphasize the development of basic vessel traffic systems in U. S. ports and waterways;"

In the implementation of vessel traffic systems, it has been the policy of the Coast Guard to proceed on the basis of cost/benefit considerations and national needs. Those ports and waterways with the most pressing marine safety needs and the most promising returns on investment receive first attention. In every area where VTS is instituted, the minimum level of VTS required is selected, and the decision is based on an assessment of total costs and benefits.

The 1973 Coast Guard Study Report, "Vessel Traffic Systems--Analysis of Port Needs" provided a firm foundation for initial VTS planning decisions. Included in the outputs of this study was a ranking of major ports and waterways based on their need for VTS, initial recommendations of the VTS levels justified in each area, and estimates of the expected number of accident preventions. In certain instances, the GAO Report has relied exclusively upon the numbers of accident preventions in evaluating Coast Guard VTS implementation decisions, while excluding from their analysis other pertinent factors relating to VTS needs and benefits. These factors are addressed in detail in the discussion in response to the second recommendation.

In the discussion of the Coast Guard's implementation of VTS the GAO Report states that systems "are becoming increasingly sophisticated and costly," and that, "in some cases, local maritime interests had expressed a preference for sophisticated systems." Notwithstanding,

present funding levels and plans for system implementation and sophistication are more conservative than early plans when VTS was first introduced. The studies completed in 1973 were undertaken to structure VTS plans, and recommendations for system complexity are very conservative. While the Coast Guard does provide for adequate consultation, comment, and coordination with local marine interests, as specified by the Ports and Waterways Safety Act of 1972, system implementation is being conducted in accordance with the plan based on national needs, implementation criteria and cost/benefit considerations. Local marine interests do express their preference for sophisticated systems and exert pressure on the Coast Guard, but the final configuration of each system is based on the Coast Guard's judgement of what level is required.

While the Coast Guard does consider the addition of surveillance capabilities as planned for certain selected areas more beneficial than communications systems in lesser ports and waterways, GAO's assessment of the benefits to be derived from such lower level systems is fully concurred in. The Intracoastal Waterway (ICW) west of New Orleans has one of the highest probabilities of accident in the nation. The GAO Report is accurate in identifying the large scale of vessel casualty prevention possible with a communications based VTS, and in selecting the optimal implementation approach in this area.

The waters of the ICW are very similar and lend themselves to simultaneous treatment through a systems approach. It would be inefficient to address each specific 10 or 20 mile section on a piecemeal basis. At the present time, detailed data collection efforts are underway on the ICW. It is planned that as soon as an effective approach is identified the ICW will be the next area addressed in VTS developments. It is anticipated that a communications system alone will provide adequate safety; however, surveillance may be incorporated in selected areas if the need is clearly demonstrated.

The Coast Guard recognizes the benefits to be derived from establishing relatively simple systems in lesser U. S. ports and waterways. In 1973, a communications system in the vicinity of McAlpine Dam on the Ohio River near Louisville, Kentucky was instituted. This system is placed in operation at those times when the flood stage at the McAlpine Dam exceeds 15 feet, a condition which causes strong outfall currents at the upstream approach to the canal entrance to the locks. During such times, it is hazardous for more than one tow to be in the vicinity of the lock approach at the same time. The VTS coordinates the arrival of the tows at this approach. At the present time, it is a voluntary system based on a VHF-FM communications network. Personnel who man the system intermittently are made available from their regular tasks by the call up of ready-reservists. Other similar systems may be initiated in response to hazardous situations in the future.

The Coast Guard agrees that in many areas relatively low level systems will provide an adequate level of safety at a favorable cost/benefit ratio.

However, a distinct need is recognized to address the major port areas now in planning with systems which will provide the reliability and effectiveness demanded by local conditions. In order to provide maximum national benefit for marine safety, it is essential that those areas with the greatest needs and highest returns on investment be addressed first. In making its implementation decisions, the Coast Guard has been considering all relevant variables and examining the incremental costs and benefits involved with each system component implementation. As systems which achieve acceptable levels of safety are completed in the major ports and waterways now under development, those lesser areas identified by GAO will be addressed. It is strongly maintained that within the limited funding constraints, low level systems in lesser areas should not be undertaken at the expense of providing surveillance capabilities in the major port areas as presently planned.

RECOMMENDATION 2: "--defer its present plans for further electronic surveillance in Houston-Galveston, New Orleans, and the East River and Newark Bay in New York until basic systems have been developed and placed in operation in these ports and several other major U. S. ports;"

This recommendation applies the concerns voiced in Recommendation 1 to the specific areas in which Coast Guard VTS planning and implementation are presently underway. The justification for present Coast Guard plans in each of these areas is discussed separately below.

It is true, as the GAO Report points out, that in some cases more numbers of vessel casualties could be prevented with communications systems in lesser areas than with surveillance additions in major areas. However, a simple tabulation of the number of vessel casualties may be misleading since there may be a large variance in the damage caused by an accident. The amount of physical damage and environmental harm resulting from a vessel casualty is dependent upon several factors including the vessel's overall size and cargo capacity, the capacity of the individual cargo tanks, the ability of the hull to withstand shock without rupturing, and the nature of the cargo.

Typically, the major U. S. ports in which VTS developments are planned or underway are frequented by vessels whose average damage in accident exceeds that of vessels engaged in operations on the inland waterways. This is due in part to the factors enumerated above. Vessels engaged in international commerce calling at major ports are generally larger in overall size and in cargo capacity. Furthermore, the size of the individual cargo tanks is an important variable in determining the threat to public and environment. Although the quantity of cargo carried by a number of barges making up a tow may be the same as that of medium sized ocean going tank vessel, the number of individual chambers in the tow greatly exceeds the number of tanks of the tanker. The risk is quite different for the same cargo. The quantity of cargo released from a

simple hull penetration of a barge tank would be less than that of a tanker sustaining the same damage. In fact the quantity of cargo permitted to be contained in a single tank for oil carrying vessels under IMCO standards is of the order of 30,000 cubic meters, a quantity that few tank barges are capable of handling.

Another major consideration is the construction and maintenance of hull and system. Although foreign flag vessels calling in major U. S. ports are built in accordance with internationally recognized classification society standards (the U. S. Coast Guard plays a supervisory role in development of those of the American Bureau of Shipping) ocean going tankers vary considerably in reliability depending on their registry as a result of differences in national marine safety programs. On the other hand, barges carrying combustible or hazardous cargo in U. S. inland waterways must conform to Coast Guard regulations for construction and maintenance stipulated in Subchapter D and Subchapter O to Title 46 CFR, directed specifically at reducing the potential for damage resulting from casualty. These are the most extensive regulations dealing with tank vessels of any nation. The regulations in Subchapter D deal with vessels which carry flammable or combustible liquids in bulk. The regulations of Subchapter O deal with vessels which carry certain dangerous bulk cargoes - those which have potential hazard beyond and including that of flammability, such as explosives, poisons, corrosive liquids, etc. (See 46 CFR 151.01)

In addition to the factors which govern the amount of physical damage to the vessel resulting from casualty, other variables must be taken into account for a complete evaluation of marine safety. Without a doubt, the cargo moving in the Houston Ship Channel is among the most hazardous in the nation. Likewise, the waters are very restricted, and have an extremely high probability of accident, based on past casualty data. Although a valid methodology has not yet been developed to quantify the potential for disaster, it is evident that vessel casualties in the Houston Ship Channel have a very high potential for catastrophe due to the nature of cargo moved and the proximity of industry handling this cargo and of the civilian population. In that area all the ingredients are present for a vessel casualty to lead to a major disaster.

Surveillance coverage of selected areas in the Houston/Galveston area will add important capabilities to Coast Guard supervision. The principal purpose of the surveillance system is to confirm vessel movement radio reports. Based on experience gained in operation of the St. Marys River system over a period of many years, it has been concluded that masters tend to hedge their movement reports to give them advantage and priority passage at critical points. This is particularly true when strict speed limits are posted. Furthermore, surveillance will detect the presence of any vessels which fail to report by radio, a condition which cannot be tolerated in an area such as the Houston Ship Channel. In the Houston/Galveston VTS the Coast Guard is also installing automated equipment to process the vessel traffic movement information. Such equipment will provide for fast, reliable information retrieval and will reduce overall manning requirements.

In New York Harbor, the GAO Report concurs in the need for surveillance of two areas, but questions the justification for surveillance in the adjacent East River and Newark Bay sectors, as planned by the Coast Guard. The same considerations present in the Houston/Galveston area also apply to New York VTS development. Furthermore, a consideration of broader scope must be taken into account in addition to the incremental benefits to be derived from surveillance in each particular section. In developing VTS for the various areas of a complex port, such as New York Harbor, the areas cannot be treated independently of each other. A total systems approach is necessary to achieve an effective system. The fact that the return on investment in surveillance is higher in one area has led GAO to the conclusion that surveillance is not justified in other parts of New York Harbor. The large number of intersections and "mixing bowls" with opposing streams of traffic demand a high degree of reliability and coordination. Therefore, the plan developed for VTS applications in a complex port must provide suitable capabilities to support both a feasible and functional system concept for the port. In addition to defining the concept of operation for the system the plan must also consider the overall operational and regulatory aspects applicable to the port.

For instance, the elimination of surveillance capabilities in the Upper and Lower Bay area would have a far-reaching and detrimental effect on the entire system, especially on the New York and New Jersey Channels. The Constable Hook area, where Kill van Kull intersects Upper Bay, is probably the most hazardous area in New York Harbor and is a prime example of this situation. Without totally accurate and complete information concerning vessel movements in Upper Bay, available only through surveillance due to the occasional unreliability of VMRS reports, the effectiveness of surveillance in Kill van Kull would be significantly eroded. Surprise meeting situations would continue to occur in that area due to vessels entering from Upper Bay which had not, or had incorrectly, reported to the VTS, and the potential for serious casualty would remain.

This consideration applies to each of the areas where selected surveillance coverage is planned. It should be noted that the surveillance planned for Newark Bay and the East River will not initially be designed to provide complete coverage. At the outset, surveillance coverage of both of these areas will be provided relatively inexpensively with a total of only three or four remote LLLTV sites.

In New Orleans, as in New York, the potential for catastrophe cannot be discounted, as vessel density is high and millions of people are within close range of the affected waters. Considering all factors, the surveillance planned for selected areas of the Mississippi River in the vicinity of New Orleans is entirely justified. It will replace the personnel required to man the traffic lights operated by the Corps of Engineers and will provide significant benefits in vessel casualty, deaths/injuries, and pollution incident reductions as well as in vessel, cargo, and property savings.

In summary, the GAO Report is accurate in pointing out that in some cases more numbers of vessel casualties could be prevented with communications systems in lesser areas than with surveillance additions in the major areas. However, when all the factors are taken into account, including differences in vessel construction, cargo, traffic density, and the potential for catastrophic environmental and personnel casualty, it is concluded that the surveillance capabilities planned will be the most cost beneficial.

RECOMMENDATION 3: "--adhere to a strict phased approach by first operating and evaluating the effectiveness of basic systems before adding more sophisticated elements;"

The GAO Report correctly states the Coast Guard's policy as set forth in a 1973 Study Report, as follows:

> "A phased approach will be stressed in the implementation of VTS (vessel traffic systems) in each port or waterway. This procedure will permit experience gained while operating the existing system to be used in planning for a more sophisticated system. It will also provide means to accumulate a better data base."

The GAO Report justifiably calls attention to the apparent inconsistency between that statement and the Coast Guard's plans to establish initially major systems incorporating surveillance and limited automated capabilities. The cause of this discrepancy is the Coast Guard's failure to update that policy statement to reflect the planning advances which have been made in the interim. Through the development and employment of several analytical tools and techniques, VTS planning has been substantially improved and formalized. In the Coast Guard's Analysis of Port Needs Study completed in late 1973, vessel casualty, transit and damage data were examined in detail for many major U. S. ports and waterways. Estimates of the effectiveness of each VTS level in each of these areas were developed in order to augment the knowledge of VTS requirements and the level of VTS necessary and justified in each area. More refined data collection and analysis techniques are now being employed at particular ports and waterways planned for VTS. Through the use of both side looking airborne radar (SLAR) and a mobile radar and communications van, detailed information is being collected concerning traffic patterns, communications loading, and vessel congestion. Likewise, simulation models have produced good projections of communications frequency and transceiver siting requirements. In addition to these analytical tools, the Coast Guard's knowledge of VTS has been expanded by the experience gained in the operation of two major systems for more than two years, and from planning the major systems in New York, Houston/Galveston, New Orleans and Valdez.

From the detailed analyses conducted in the major ports and waterways under development, the Coast Guard has determined that a higher level

of VTS (than the minimum first step) is both required and justified. In such areas, that level of VTS which is considered necessary with a high degree of certainty is being established initially. It should be recognized that even in those areas, the initial implementation may be accomplished in a multi-year approach, but this "phasing" is due to budgetary constraints rather than uncertainty over system needs. The operation of all systems will undergo continuing scrutiny and evaluation. Any modifications or additions which are judged necessary will be undertaken in a subsequent phase(s).

The Coast Guard recognizes the importance of continuing to add to the knowledge base concerning VTS Systems and Operations. Statutory responsibility to provide vessel traffic systems and services has existed for a very short time -- just over two years, although the legislation was preceded by the establishment of an Advisory Radar System at San Francisco. San Francisco thus became the Field Testing Site for VTS research and development projects. At that location the operational system uses the High Resolution Radars that were developed on an R&D basis. Automated features representative of the more sophisticated VTS levels are maintained there on an experimental basis. Achievement of major hardware advancements, however, does not mean completion of research and development efforts, for much remains to be acquired in the way of operational knowledge before United States Vessel Traffic Systems reach maturity. This is especially evident in the fact that VTS operations have not yet entered into the more complex modes under which vessels are provided movement control by the Coast Guard. Accordingly, developmental emphasis is expected to shift from hardware to operations. Important areas of investigation and definition include the formulation of operational control concepts and the generation of port by port VTS System Functional Requirements based upon traffic analyses, hydrographic data and the (separately derived) operational control concepts. The Department of Transportation recognizes existence of certain parallels along with major differences between Air Traffic Control and Vessel Traffic Control. Without attempting to detail these, it is clear from the aviation experience that there are continuing lessons to be learned in arriving at a national set of Vessel Traffic Systems which operate effectively at lowest system cost. The VTS Research and Development Program in the Coast Guard builds on existing knowledge to help achieve this goal.

RECOMMENDATION 4: "--give national emphasis and direction to establishing regulations as authorized by the 1972 Act to control vessel traffic, including more extensive use of speed limits; greater regulation over the movement of vessels carrying dangerous, combustible and polluting cargos; and limiting the size of tows."

The GAO Report stated that the Coast Guard had made limited use of its authority under the Ports and Waterways Safety Act to issue regulations

for the control of vessel movements, and identified control of vessel speed, control of the movement of vessels carrying hazardous or polluting cargoes, and control of tow size as regulatory measures expected to be effective for prevention of accidents. The GAO Report further detailed inconsistencies between headquarters, district and field units in the approach to development of regulations under the Act. The promulgation of regulations was stated to be the measure least costly to the government for reducing accidents through control of vessel movement.

The Coast Guard recognizes the essentiality of these constraints and they are being developed at Headquarters. However, the task of developing meaningful regulatory guidance at the national level is a good deal more profound than may be realized. The Ports and Waterways Safety Act empowers the Coast Guard to regulate the vessel with regard to its route. Such regulations must be merged in a harmonious way with other regulations by which maritime safety in the United States has for years been governed by the Coast Guard. Along with the operational constraints under the Ports and Waterways Safety Act, the preexisting regulation of safety and construction of the vessel, qualification of crew, safe handling and carriage of cargoes, anchorages, and Rules of the Road form a matrix addressing all elements of the system.

The development of a regulation is an exacting process which requires care in the identification of the problem to be corrected by means of the regulation, recognition of varied geographic and operating conditions, an appreciation of the impact of the regulation on the public affected, including the broad economic effect of the measure, and finally, definition of the corrective regulation. Presumably in recognition of these factors, the Ports and Waterways Safety Act contains a provision for consultation and comment by interested parties in preparation of proposed regulations; this is in addition to the requirements of the Administrative Procedures Act.

Inconsistencies which may appear to exist at the field level could well be due to local efforts to cater for variations in type of vessel, climatic conditions, and waterway configuration. Such local solutions with their differences will, as feedback, prove beneficial in the preparation of a comprehensive statement from the headquarters level.

The first significant rulemaking under the Act was accomplished in the Puget Sound VTS regulations which became effective on 30 September 1974. These regulations addressed a local problem, identification and solution of which were more readily handled than broad nationwide regulations. Once developed, however, these regulations contained most of the elements which will be employed in other systems, and as such will serve as a model for VTS rulemaking in other areas. Draft regulations now in preparation for San Francisco and Houston VTS draw extensively on the principles worked out for Puget Sound.

Regulations which address navigation and certain vessel operations have been promulgated for Chesapeake Bay, Delaware Bay and Apra Harbor, Guam. Principles employed in these regulations will be applicable to other areas.

Rulemaking actions appeared in the Federal Register on 1 March 1974 and 28 June 1974. Final rulemaking under the first of these actions is now in draft and will be published in the near future. This regulation will enable the District Commander, Captain of the Port, or their authorized representative to direct or control the movements of vessels under emergency or temporarily hazardous conditions when necessary for safety. This is the first regulation of nationwide application under the Ports and Waterways Safety Act. The second action is an advance notification of a broad philosophical approach the Coast Gaurd intends to follow in regulating the safe movement of vessels by means of operating controls. The work of drafting principles for proposed rulemaking is in progress and addresses equipment required to be on board vessels, tests of machinery and equipment, movement of hazardous and polluting cargoes, and safe operating procedures. The specific principles will be referred to interested parties for consultation in preparing the proposed rules.

The GAO Report places emphasis on control of vessel speed as an effective measure for prevention of accidents. The Ports and Waterways Safety Act gives the Coast Guard authority to control vessel traffic by means of speed limitations in areas determined to be especially hazardous. The U. S. Army, Corps of Engineers presently regulates vessel speed under authority of 33 USC 1. Preliminary arrangements have been made to relieve the Corps of Engineers of this function in all but certain waters of particular interest to the Army. The GAO Report indicated a greater incidence of accidents attributed to excessive vessel speed than Coast Guard analysis of the raw data can support. The Coast Guard is mindful that speed is often listed as a contributing cause to accidents. However, vessel speed alone is rarely the sole cause. The effective regulation of vessel speed is a complex matter related to vessel size and maneuvering characteristics, channel configuration, harbor congestion, weather and visibility, and involves far-reaching economic considerations. The Coast Guard will move forward with repromulgation of the Army Corps of Engineers' regulations where appropriate under authority of the Act, and the development on a case by case basis of regulations to limit vessel speed where necessary in especially hazardous areas.

The GAO Report advised of inconsistency on the part of the Coast Guard in different ports in applying suitable controls to the movement of vessels carrying hazardous or polluting cargoes. Current regulations require advance notification of arrival of any vessel loaded with cargoes of particular hazard. Action taken by the Coast Guard locally upon receipt of that notification will vary according to the particular requirements of different ports, so that some inconsistency is inescapable. The rulemaking, previously discussed for the operational control of vessel

movements, will provide the regulatory tools necessary for effective action commensurate to the hazard and the particular area. As an adjunct the Coast Guard is considering an industry proposal to require visual, aerial identification of certain inland barges which carry hazardous or polluting cargoes.

Limitation of tow size and the powering of towing vessels were discussed in the GAO report, in part related to repeated casualties at two bridges. The Coast Guard has eliminated this problem at the West Port Arthur Bridge in Texas by widening the draw under the authority of the Truman Hobbs Act. Since that action there has been no casualty attributable to the obstructive nature of the bridge, (or conversely those factors of tow size related to towboat power which could be addressed in regulations). In 1973 and again in 1974 the Coast Guard issued Special Navigation Orders for the protection of the Southern Pacific Railway Bridge at Berwick Bay, Louisiana. These orders, among other things, limited the size of tows permitted to pass through this bridge and established arbitrary horsepower requirements. Work is now in progress to establish a VTS at Berwick Bay for the protection of this bridge. Regulations will be developed for this VTS which will draw on the experience gained with the Special Navigation Orders. Efforts to establish criteria for tow boat power related to the ability to control barges, as called out by the N.T.S.B. report in 1972, have not thus far met with success. The Coast Guard is pursuing solution in two ways: research and development efforts in progress are addressing vessel maneuverability, of which power related to tonnage is a significant consideration; and, the problem has been referred to the Towing Industry Advisory Committee to the Marine Safety Council for an empirical solution based on industry practice.

Other measures the GAO discussed which may improve vessel safety are the requirement for drawbridges to be equipped with bridge-to-bridge radio telephone (VHF-FM Channel 13, 156.65 MHz), and the requirement for vessels to have on board some form of precision navigation equipment. The Coast Guard has been generally successful in its efforts to have bridge owners voluntarily equip draw bridges with bridge-to-bridge radiotelephone. Furthermore, in order to address those bridges which have not been so voluntarily equipped, the Coast Guard has sought legislation which would require the bridge owner to install this equipment at the same time bridge protective systems (fendering) are constructed or altered. Loran "C" may prove to be the suitable form of navigation equipment suggested in the report. The Coast Guard has no plans at this time to require Loran "C" to be carried on certain classes of vessels. If the necessary study of this matter should indicate the installation of Loran "C" equipment should be required, regulations towards this end may be developed under the Act.

Recognizing the overall scope of the work of drafting regulations which lies ahead, the Coast Guard is undertaking the development of a

comprehensive Ports and Waterways Safety Act regulation plan towards this end. In order to assure a uniform understanding of the basis for the development of these regulations and their equitable enforcement, timely guidance will be circulated to the field.

Several errors and inaccuracies have been found in both the GAO Draft Report and final Report. The Comptroller General was alerted to these discrepancies in Appendix C of the DOT Statement on the GAO Draft Report, which was transmitted on January 21, 1975.

IV. STATUS OF CORRECTIVE ACTION

The Coast Guard intends to implement the vessel traffic system program on the basis of cost/benefit considerations and national needs. In keeping with these considerations, and the recommendations of the GAO Report, the next major VTS start is planned for the ICW. Detailed data collection efforts are now underway to identify the marine traffic safety needs more clearly and to help structure a comprehensive approach which will address the entire area most cost effectively. The VTS needs of Chesapeake Bay, an area which the GAO Report recommended for VTS implementation, are presently under study at the local level. By July 1, 1975 the Commander, Fifth Coast Guard District expects this examination along with system recommendations to be complete.

While the Coast Guard's position concerning implementation through a strict phased approach has been previously clarified, analyses of operational effectiveness will be conducted annually for each of the systems. After the selected level(s) has been established and in operation, such analyses will be used to identify the need for possible system upgrading and modification.

For the most part, the GAO Report's Recommendation concerning the promulgation of regulations under the Ports and Waterways Safety Act of 1972 is concurred in. Efforts are underway to identify those aspects of marine safety which lend themselves to universal regulatory treatment. As such problem areas are identified, nationwide direction to field units will be provided by Coast Guard Headquarters. In other instances, the peculiarity of local conditions will require local regulatory remedies. In any case, greater emphasis is being given to marine safety regulations, and recent headquarters staff augmentation should expedite the entire process.

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

APPENDIX A

SUMMARY OF VTS COSTS BY SYSTEM BY LEVEL
(Costs by levels are incremental)

Port or Waterway	System Component	AC&I Cost	Annual Operating Expense[1]	Present Value of Total 15 year cost (discounted at 10%)
San Francisco	Present Configuration: AC&I Cost includes all VTS R&D	5.8M	700K	11.1M
Puget Sound	VMRS	1.0M	340K	3.6M
	Radar	1.0M	280K	3.1M
	Total	2.0M	620K	6.7M
Houston/Galveston	VMRS	1.2M	570K	5.5M
	LLTV	.8M	120K	1.7M
	Radar	.7M	100K	1.5M
	Total	2.7M	790K	8.7M
New York	VMRS	1.6M	800K	7.7M
	LLTV	1.7M	250K	3.6M
	Radar	1.2M	180K	2.6M
	Total	4.5M	1230K	13.9M
New Orleans & Miss. River to Baton Rouge	VMRS	1.7M	800K	7.8M
	LLTV	.6M	100K	1.4M
	Total	2.3M	900K	9.2M
Valdez	VMRS	3.1M	700K	8.4M
	Radar	1.5M	225K	3.2M
	Total	4.6M	925K	11.6M

[1]Operating personnel costs are included

In each of the areas, the VTS levels indicated and costed are those which are presently in operation or planned for implementation. Additions or improvements may be made subsequently after experience is gained from system operations.

The cost estimates provided in this appendix are based on 1 August 1974 engineering cost estimates, and do not in all cases coincide exactly with previous budgetary requests and documentation.

25 FEB 1976

DEPARTMENT OF TRANSPORTATION
STATEMENT ON GAO REPORT

I. TITLE: REPORT TO THE CONGRESS OF THE UNITED STATES

VESSEL TRAFFIC SYSTEMS--

WHAT IS NEEDED TO PREVENT AND REDUCE VESSEL ACCIDENTS?

II. GAO FINDINGS AND RECOMMENDATIONS

It is the conclusion of the GAO Report that the vessel traffic system (VTS) program should be redirected in order to produce maximum benefit in reducing loss of life, injuries, and damage to property and the environment caused by vessel collisions, rammings, and groundings. On the basis of system acquisition and construction costs, GAO has classified the various levels of VTS into two categories: "basic" and "sophisticated." "Basic" systems include regulations, traffic separation and routing schemes, and vessel movement reporting communications systems (VMRS). Systems which utilize electronic surveillance or automated equipment have been termed "sophisticated."

GAO considers that greater incremental benefits can be gained from the development of "basic" systems in many ports and waterways than from the addition of "sophisticated" system elements in the major port areas presently under development. The GAO Report contends that the Coast Guard should follow a strict phased approach in all ports and waterways by first operating and evaluating the effectiveness of basic systems before adding increased system capabilities, such as surveillance or automation.

The Report recommends that plans to add surveillance capabilities in Houston/Galveston, New Orleans, and sections of New York be deferred until "basic" systems have been developed in several other U. S. ports and waterways. Additionally, GAO has concluded that expanded efforts in establishing regulations under the Ports and Waterways Safety Act of 1972 are required. It is recommended that national emphasis and direction be given to establishing regulations including vessel speed limits, limiting the size of tows, and regulating the movement of vessels carrying dangerous, combustible and polluting cargoes.

III. DOT COMMENTS ON FINDINGS AND RECOMMENDATIONS

In order to assess accurately the direction of the vessel traffic system program, clarification of two points which form the basis of the GAO Report is essential.

A misconception of the trend of costs for VTS levels appears in the GAO Report, inasmuch as only acquisition and construction costs are quoted. For a more complete analysis of system costs, annual operating expenses, such as personnel salaries, which comprise a substantial component of total costs, must also be taken into account. All Coast Guard decisions concerning the selection of VTS levels for the areas under development have been based upon an analysis of total system costs and benefits. Appendix A provides detailed cost information for both initial construction and annual operating costs by system and level. Analysis of total costs rather than just initial costs provides more comprehensive information for decision making purposes.

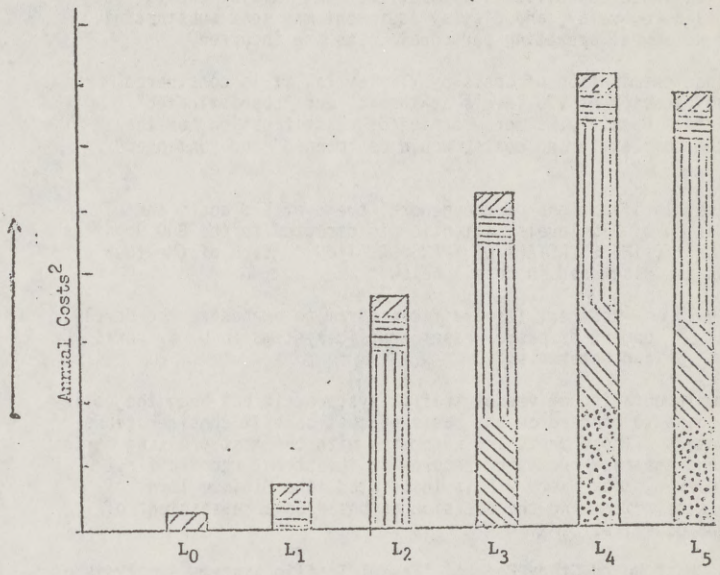
The second point which deserves expansion and explanation is the GAO Report classification of VTS levels as "basic" and "sophisticated." While there is merit in the basic concern for cost effectiveness voiced in the GAO Report, this classification fails to address the relevant system cost and complexity considerations of the specific ports and waterways. For example, the GAO Report categorizes a VHRS communications system as "basic" and those systems incorporating surveillance capabilities as "sophisticated." In many cases these labels are not accurate from either an engineering or cost standpoint.

In areas where traffic density and volume are high and traffic patterns complicated, a VHRS may require automated (i. e., "sophisticated") equipment to provide fast, effective data retrieval for traffic management. Where this need exists, the only alternative to automated system components is greatly increased manning level (and cost), accompanied by an increase in the probability of human error. On the other hand, some surveillance systems may be very "basic" consisting of only a radar and scope presentation or low light level television (LLLTV) to monitor vessel movements and to validate the accuracy of VHRS reports.

The GAO Report's classification of VTS levels is also inappropriate on the basis of total system costs. The following bar graph, from an earlier Coast Guard Study Report, depicts the general trend of annual costs by VTS level for the "typical" VTS. The cost figures in the bar graph are based on a hypothetical VTS in which all levels are employed, with three to four remote communications sites and two to three remote radar sites. Annual costs were computed by adding annual operating expenses to the initial implementation costs divided by 15 years. The figure of 15 years, estimated to be the expected life of each system, may be subject to argument, but this figure is considered valid since the costs of equipment replacement are included in annual costs.

General Trend of Annual Costs
Versus
VTS Level[1]

Graph assumes hypothetical VTS in which all VTS levels can be used.



[1]Definition of Levels and Legend of costs

L_0- Vessel Bridge to Bridge Radiotelephone . . .
L_1- Traffic Separation Scheme . . . . . .
L_2- Vessel Movement Reporting System . . . . . .
L_3- Basic Surveillance . . . . . .
L_4- Advanced Surveillance. . . . . .
L_5- Automated Advanced Surveillance. . . . . N/A

[2]Annual cost is defined as the construction cost divided by fifteen years plus the annual operating costs. Costs are based on actual costs for Puget Sound (Phase I) and San Francisco, and on estimated costs for Houston-Galveston and New Orleans (Phase I).

As portrayed by the bar graph, the most dramatic increase in annual costs occurs in moving from a traffic separation scheme to a vessel movement reporting system (VMRS). The establishment of a VMRS involves the construction and outfitting of a vessel traffic center, remote communications sites in most cases and extensive personnel costs for continuous watchstanding and operation. Comparatively, the cost increase in adding surveillance capabilities is smaller. The initial capital outlay for surveillance, relay, and display equipment may seem substantial, but little or no annual operating personnel costs are incurred.

After close examination of costs by VTS levels, it is considered that the classification of VTS levels as "basic" and "sophisticated" is inappropriate. Possibly, a more meaningful classification, on the basis of system complexity and costs, would be "manned" and "unmanned" systems.

With these clarifications of the general trend of VTS costs and of the classification of VTS levels, attention is directed to the GAO Report's "RECOMMENDATIONS TO THE SECRETARY OF TRANSPORTATION." Each of the four recommendations is discussed in detail below.

RECOMMENDATION 1: "--redirect its traffic program to emphasize the development of basic vessel traffic systems in U. S. ports and waterways;"

In the implementation of vessel traffic systems, it has been the policy of the Coast Guard to proceed on the basis of cost/benefit considerations and national needs. Those ports and waterways with the most pressing marine safety needs and the most promising returns on investment receive first attention. In every area where VTS is instituted, the minimum level of VTS required is selected, and the decision is based on an assessment of total costs and benefits.

The 1973 Coast Guard Study Report, "Vessel Traffic Systems--Analysis of Port Needs" provided a firm foundation for initial VTS planning decisions. Included in the outputs of this study was a ranking of major ports and waterways based on their need for VTS, initial recommendations of the VTS levels justified in each area, and estimates of the expected number of accident preventions. In certain instances, the GAO Report has relied exclusively upon the numbers of accident preventions in evaluating Coast Guard VTS implementation decisions, while excluding from their analysis other pertinent factors relating to VTS needs and benefits. These factors are addressed in detail in the discussion in response to the second recommendation.

In the discussion of the Coast Guard's implementation of VTS the GAO Report states that systems "are becoming increasingly sophisticated and costly," and that, "in some cases, local maritime interests had expressed a preference for sophisticated systems." Notwithstanding,

present funding levels and plans for system implementation and sophistication are more conservative than early plans when VTS was first introduced. The studies completed in 1973 were undertaken to structure VTS plans, and recommendations for system complexity are very conservative. While the Coast Guard does provide for adequate consultation, comment, and coordination with local marine interests, as specified by the Ports and Waterways Safety Act of 1972, system implementation is being conducted in accordance with the plan based on national needs, implementation criteria and cost/benefit considerations. Local marine interests do express their preference for sophisticated systems and exert pressure on the Coast Guard, but the final configuration of each system is based on the Coast Guard's judgement of what level is required.

While the Coast Guard does consider the addition of surveillance capabilities as planned for certain selected areas more beneficial than communications systems in lesser ports and waterways, GAO's assessment of the benefits to be derived from such lower level systems is fully concurred in. The Intracoastal Waterway (ICW) west of New Orleans has one of the highest probabilities of accident in the nation. The GAO Report is accurate in identifying the large scale of vessel casualty prevention possible with a communications based VTS, and in selecting the optimal implementation approach in this area.

The waters of the ICW are very similar and lend themselves to simultaneous treatment through a systems approach. It would be inefficient to address each specific 10 or 20 mile section on a piecemeal basis. At the present time, detailed data collection efforts are underway on the ICW. It is planned that as soon as an effective approach is identified the ICW will be the next area addressed in VTS developments. It is anticipated that a communications system alone will provide adequate safety; however, surveillance may be incorporated in selected areas if the need is clearly demonstrated.

The Coast Guard recognizes the benefits to be derived from establishing relatively simple systems in lesser U. S. ports and waterways. In 1973, a communications system in the vicinity of McAlpine Dam on the Ohio River near Louisville, Kentucky was instituted. This system is placed in operation at those times when the flood stage at the McAlpine Dam exceeds 15 feet, a condition which causes strong outfall currents at the upstream approach to the canal entrance to the locks. During such times, it is hazardous for more than one tow to be in the vicinity of the lock approach at the same time. The VTS coordinates the arrival of the tows at this approach. At the present time, it is a voluntary system based on a VHF-FM communications network. Personnel who man the system intermittently are made available from their regular tasks by the call up of ready-reservists. Other similar systems may be initiated in response to hazardous situations in the future.

The Coast Guard agrees that in many areas relatively low level systems will provide an adequate level of safety at a favorable cost/benefit ratio.

However, a distinct need is recognized to address the major port areas now in planning with systems which will provide the reliability and effectiveness demanded by local conditions. In order to provide maximum national benefit for marine safety, it is essential that those areas with the greatest needs and highest returns on investment be addressed first. In making its implementation decisions, the Coast Guard has been considering all relevant variables and examining the incremental costs and benefits involved with each system component implementation. As systems which achieve acceptable levels of safety are completed in the major ports and waterways now under development, those lesser areas identified by GAO will be addressed. It is strongly maintained that within the limited funding constraints, low level systems in lesser areas should not be undertaken at the expense of providing surveillance capabilities in the major port areas as presently planned.

RECOMMENDATION 2: "--defer its present plans for further electronic surveillance in Houston-Galveston, New Orleans, and the East River and Newark Bay in New York until basic systems have been developed and placed in operation in these ports and several other major U. S. ports;"

This recommendation applies the concerns voiced in Recommendation 1 to the specific areas in which Coast Guard VTS planning and implementation are presently underway. The justification for present Coast Guard plans in each of these areas is discussed separately below.

It is true, as the GAO Report points out, that in some cases more numbers of vessel casualties could be prevented with communications systems in lesser areas than with surveillance additions in major areas. However, a simple tabulation of the number of vessel casualties may be misleading since there may be a large variance in the damage caused by an accident. The amount of physical damage and environmental harm resulting from a vessel casualty is dependent upon several factors including the vessel's overall size and cargo capacity, the capacity of the individual cargo tanks, the ability of the hull to withstand shock without rupturing, and the nature of the cargo.

Typically, the major U. S. ports in which VTS developments are planned or underway are frequented by vessels whose average damage in accident exceeds that of vessels engaged in operations on the inland waterways. This is due in part to the factors enumerated above. Vessels engaged in international commerce calling at major ports are generally larger in overall size and in cargo capacity. Furthermore, the size of the individual cargo tanks is an important variable in determining the threat to public and environment. Although the quantity of cargo carried by a number of barges making up a tow may be the same as that of medium sized ocean going tank vessel, the number of individual chambers in the tow greatly exceeds the number of tanks of the tanker. The risk is quite different for the same cargo. The quantity of cargo released from a

simple hull penetration of a barge tank would be less than that of a tanker sustaining the same damage. In fact the quantity of cargo permitted to be contained in a single tank for oil carrying vessels under IMCO standards is of the order of 30,000 cubic meters, a quantity that few tank barges are capable of handling.

Another major consideration is the construction and maintenance of hull and system. Although foreign flag vessels calling in major U. S. ports are built in accordance with internationally recognized classification society standards (the U. S. Coast Guard plays a supervisory role in development of those of the American Bureau of Shipping) ocean going tankers vary considerably in reliability depending on their registry as a result of differences in national marine safety programs. On the other hand, barges carrying combustible or hazardous cargo in U. S. inland waterways must conform to Coast Guard regulations for construction and maintenance stipulated in Subchapter D and Subchapter O to Title 46 CFR, directed specifically at reducing the potential for damage resulting from casualty. These are the most extensive regulations dealing with tank vessels of any nation. The regulations in Subchapter D deal with vessels which carry flammable or combustible liquids in bulk. The regulations of Subchapter O deal with vessels which carry certain dangerous bulk cargoes - those which have potential hazard beyond and including that of flammability, such as explosives, poisons, corrosive liquids, etc. (See 46 CFR 151.01)

In addition to the factors which govern the amount of physical damage to the vessel resulting from casualty, other variables must be taken into account for a complete evaluation of marine safety. Without a doubt, the cargo moving in the Houston Ship Channel is among the most hazardous in the nation. Likewise, the waters are very restricted, and have an extremely high probability of accident, based on past casualty data. Although a valid methodology has not yet been developed to quantify the potential for disaster, it is evident that vessel casualties in the Houston Ship Channel have a very high potential for catastrophe due to the nature of cargo moved and the proximity of industry handling this cargo and of the civilian population. In that area all the ingredients are present for a vessel casualty to lead to a major disaster.

Surveillance coverage of selected areas in the Houston/Galveston area will add important capabilities to Coast Guard supervision. The principal purpose of the surveillance system is to confirm vessel movement radio reports. Based on experience gained in operation of the St. Marys River system over a period of many years, it has been concluded that masters tend to hedge their movement reports to give them advantage and priority passage at critical points. This is particularly true when strict speed limits are posted. Furthermore, surveillance will detect the presence of any vessels which fail to report by radio, a condition which cannot be tolerated in an area such as the Houston Ship Channel. In the Houston/Galveston VTS the Coast Guard is also installing automated equipment to process the vessel traffic movement information. Such equipment will provide for fast, reliable information retrieval and will reduce overall manning requirements.

In New York Harbor, the GAO Report concurs in the need for surveillance of two areas, but questions the justification for surveillance in the adjacent East River and Newark Bay sectors, as planned by the Coast Guard. The same considerations present in the Houston/Galveston area also apply to New York VTS development. Furthermore, a consideration of broader scope must be taken into account in addition to the incremental benefits to be derived from surveillance in each particular section. In developing VTS for the various areas of a complex port, such as New York Harbor, the areas cannot be treated independently of each other. A total systems approach is necessary to achieve an effective system. The fact that the return on investment in surveillance is higher in one area has led GAO to the conclusion that surveillance is not justified in other parts of New York Harbor. The large number of intersections and "mixing bowls" with opposing streams of traffic demand a high degree of reliability and coordination. Therefore, the plan developed for VTS applications in a complex port must provide suitable capabilities to support both a feasible and functional system concept for the port. In addition to defining the concept of operation for the system the plan must also consider the overall operational and regulatory aspects applicable to the port.

For instance, the elimination of surveillance capabilities in the Upper and Lower Bay area would have a far-reaching and detrimental effect on the entire system, especially on the New York and New Jersey Channels. The Constable Hook area, where Kill van Kull intersects Upper Bay, is probably the most hazardous area in New York Harbor and is a prime example of this situation. Without totally accurate and complete information concerning vessel movements in Upper Bay, available only through surveillance due to the occasional unreliability of VMRS reports, the effectiveness of surveillance in Kill van Kull would be significantly eroded. Surprise meeting situations would continue to occur in that area due to vessels entering from Upper Bay which had not, or had incorrectly, reported to the VTS, and the potential for serious casualty would remain.

This consideration applies to each of the areas where selected surveillance coverage is planned. It should be noted that the surveillance planned for Newark Bay and the East River will not initially be designed to provide complete coverage. At the outset, surveillance coverage of both of these areas will be provided relatively inexpensively with a total of only three or four remote LLLTV sites.

In New Orleans, as in New York, the potential for catastrophe cannot be discounted, as vessel density is high and millions of people are within close range of the affected waters. Considering all factors, the surveillance planned for selected areas of the Mississippi River in the vicinity of New Orleans is entirely justified. It will replace the personnel required to man the traffic lights operated by the Corps of Engineers and will provide significant benefits in vessel casualty, deaths/injuries, and pollution incident reductions as well as in vessel, cargo, and property savings.

In summary, the GAO Report is accurate in pointing out that in some cases more numbers of vessel casualties could be prevented with communications systems in lesser areas than with surveillance additions in the major areas. However, when all the factors are taken into account, including differences in vessel construction, cargo, traffic density, and the potential for catastrophic environmental and personnel casualty, it is concluded that the surveillance capabilities planned will be the most cost beneficial.

RECOMMENDATION 3: "--adhere to a strict phased approach by first operating and evaluating the effectiveness of basic systems before adding more sophisticated elements;"

The GAO Report correctly states the Coast Guard's policy as set forth in a 1973 Study Report, as follows:

> "A phased approach will be stressed in the implementation of VTS (vessel traffic systems) in each port or waterway. This procedure will permit experience gained while operating the existing system to be used in planning for a more sophisticated system. It will also provide means to accumulate a better data base."

The GAO Report justifiably calls attention to the apparent inconsistency between that statement and the Coast Guard's plans to establish initially major systems incorporating surveillance and limited automated capabilities. The cause of this discrepancy is the Coast Guard's failure to update that policy statement to reflect the planning advances which have been made in the interim. Through the development and employment of several analytical tools and techniques, VTS planning has been substantially improved and formalized. In the Coast Guard's Analysis of Port Needs Study completed in late 1973, vessel casualty, transit and damage data were examined in detail for many major U. S. ports and waterways. Estimates of the effectiveness of each VTS level in each of these areas were developed in order to augment the knowledge of VTS requirements and the level of VTS necessary and justified in each area. More refined data collection and analysis techniques are now being employed at particular ports and waterways planned for VTS. Through the use of both side looking airborne radar (SLAR) and a mobile radar and communications van, detailed information is being collected concerning traffic patterns, communications loading, and vessel congestion. Likewise, simulation models have produced good projections of communications frequency and transceiver siting requirements. In addition to these analytical tools, the Coast Guard's knowledge of VTS has been expanded by the experience gained in the operation of two major systems for more than two years, and from planning the major systems in New York, Houston/Galveston, New Orleans and Valdez.

From the detailed analyses conducted in the major ports and waterways under development, the Coast Guard has determined that a higher level

of VTS (than the minimum first step) is both required and justified. In such areas, that level of VTS which is considered necessary with a high degree of certainty is being established initially. It should be recognized that even in those areas, the initial implementation may be accomplished in a multi-year approach, but this "phasing" is due to budgetary constraints rather than uncertainty over system needs. The operation of all systems will undergo continuing scrutiny and evaluation. Any modifications or additions which are judged necessary will be undertaken in a subsequent phase(s).

The Coast Guard recognizes the importance of continuing to add to the knowledge base concerning VTS Systems and Operations. Statutory responsibility to provide vessel traffic systems and services has existed for a very short time -- just over two years, although the legislation was preceded by the establishment of an Advisory Radar System at San Francisco. San Francisco thus became the Field Testing Site for VTS research and development projects. At that location the operational system uses the High Resolution Radars that were developed on an R&D basis. Automated features representative of the more sophisticated VTS levels are maintained there on an experimental basis. Achievement of major hardware advancements, however, does not mean completion of research and development efforts, for much remains to be acquired in the way of operational knowledge before United States Vessel Traffic Systems reach maturity. This is especially evident in the fact that VTS operations have not yet entered into the more complex modes under which vessels are provided movement control by the Coast Guard. Accordingly, developmental emphasis is expected to shift from hardware to operations. Important areas of investigation and definition include the formulation of operational control concepts and the generation of port by port VTS System Functional Requirements based upon traffic analyses, hydrographic data and the (separately derived) operational control concepts. The Department of Transportation recognizes existence of certain parallels along with major differences between Air Traffic Control and Vessel Traffic Control. Without attempting to detail these, it is clear from the aviation experience that there are continuing lessons to be learned in arriving at a national set of Vessel Traffic Systems which operate effectively at lowest system cost. The VTS Research and Development Program in the Coast Guard builds on existing knowledge to help achieve this goal.

RECOMMENDATION 4: "--give national emphasis and direction to establishing regulations as authorized by the 1972 Act to control vessel traffic, including more extensive use of speed limits; greater regulation over the movement of vessels carrying dangerous, combustible and polluting cargos; and limiting the size of tows."

The GAO Report stated that the Coast Guard had made limited use of its authority under the Ports and Waterways Safety Act to issue regulations

for the control of vessel movements, and identified control of vessel speed, control of the movement of vessels carrying hazardous or polluting cargoes, and control of tow size as regulatory measures expected to be effective for prevention of accidents. The GAO Report further detailed inconsistencies between headquarters, district and field units in the approach to development of regulations under the Act. The promulgation of regulations was stated to be the measure least costly to the government for reducing accidents through control of vessel movement.

The Coast Guard recognizes the essentiality of these constraints and they are being developed at Headquarters. However, the task of developing meaningful regulatory guidance at the national level is a good deal more profound than may be realized. The Ports and Waterways Safety Act empowers the Coast Guard to regulate the vessel with regard to its route. Such regulations must be merged in a harmonious way with other regulations by which maritime safety in the United States has for years been governed by the Coast Guard. Along with the operational constraints under the Ports and Waterways Safety Act, the preexisting regulation of safety and construction of the vessel, qualification of crew, safe handling and carriage of cargoes, anchorages, and Rules of the Road form a matrix addressing all elements of the system.

The development of a regulation is an exacting process which requires care in the identification of the problem to be corrected by means of the regulation, recognition of varied geographic and operating conditions, an appreciation of the impact of the regulation on the public affected, including the broad economic effect of the measure, and finally, definition of the corrective regulation. Presumably in recognition of these factors, the Ports and Waterways Safety Act contains a provision for consultation and comment by interested parties in preparation of proposed regulations; this is in addition to the requirements of the Administrative Procedures Act.

Inconsistencies which may appear to exist at the field level could well be due to local efforts to cater for variations in type of vessel, climatic conditions, and waterway configuration. Such local solutions with their differences will, as feedback, prove beneficial in the preparation of a comprehensive statement from the headquarters level.

The first significant rulemaking under the Act was accomplished in the Puget Sound VTS regulations which became effective on 30 September 1974. These regulations addressed a local problem, identification and solution of which were more readily handled than broad nationwide regulations. Once developed, however, these regulations contained most of the elements which will be employed in other systems, and as such will serve as a model for VTS rulemaking in other areas. Draft regulations now in preparation for San Francisco and Houston VTS draw extensively on the principles worked out for Puget Sound.

Regulations which address navigation and certain vessel operations have been promulgated for Chesapeake Bay, Delaware Bay and Apra Harbor, Guam. Principles employed in these regulations will be applicable to other areas.

Rulemaking actions appeared in the Federal Register on 1 March 1974 and 28 June 1974. Final rulemaking under the first of these actions is now in draft and will be published in the near future. This regulation will enable the District Commander, Captain of the Port, or their authorized representative to direct or control the movements of vessels under emergency or temporarily hazardous conditions when necessary for safety. This is the first regulation of nationwide application under the Ports and Waterways Safety Act. The second action is an advance notification of a broad philosophical approach the Coast Gaurd intends to follow in regulating the safe movement of vessels by means of operating controls. The work of drafting principles for proposed rulemaking is in progress and addresses equipment required to be on board vessels, tests of machinery andequipment, movement of hazardous and polluting cargoes, and safe operating procedures. The specific principles will be referred to interested parties for consultation in preparing the proposed rules.

The GAO Report places emphasis on control of vessel speed as an effective measure for prevention of accidents. The Ports and Waterways Safety Act gives the Coast Guard authority to control vessel traffic by means of speed limitations in areas determined to be especially hazardous. The U. S. Army, Corps of Engineers presently regulates vessel speed under authority of 33 USC 1. Preliminary arrangements have been made to relieve the Corps of Engineers of this function in all but certain waters of particular interest to the Army. The GAO Report indicated a greater incidence of accidents attributed to excessive vessel speed than Coast Guard analysis of the raw data can support. The Coast Guard is mindful that speed is often listed as a contributing cause to accidents. However, vessel speed alone is rarely the sole cause. The effective regulation of vessel speed is a complex matter related to vessel size and maneuvering characteristics, channel configuration, harbor congestion, weather and visibility, and involves far-reaching economic considerations. The Coast Guard will move forward with repromulgation of the Army Corps of Engineers' regulations where appropriate under authority of the Act, and the development on a case by case basis of regulations to limit vessel speed where necessary in especially hazardous areas.

The GAO Report advised of inconsistency on the part of the Coast Guard in different ports in applying suitable controls to the movement of vessels carrying hazardous or polluting cargoes. Current regulations require advance notification of arrival of any vessel loaded with cargoes of particular hazard. Action taken by the Coast Guard locally upon receipt of that notification will vary according to the particular requirements of different ports, so that some inconsistency is inescapable. The rulemaking, previously discussed for the operational control of vessel

movements, will provide the regulatory tools necessary for effective action commensurate to the hazard and the particular area. As an adjunct the Coast Guard is considering an industry proposal to require visual, aerial identification of certain inland barges which carry hazardous or polluting cargoes.

Limitation of tow size and the powering of towing vessels were discussed in the GAO report, in part related to repeated casualties at two bridges. The Coast Guard has eliminated this problem at the West Port Arthur Bridge in Texas by widening the draw under the authority of the Truman Hobbs Act. Since that action there has been no casualty attributable to the obstructive nature of the bridge, (or conversely those factors of tow size related to towboat power which could be addressed in regulations). In 1973 and again in 1974 the Coast Guard issued Special Navigation Orders for the protection of the Southern Pacific Railway Bridge at Berwick Bay, Louisiana. These orders, among other things, limited the size of tows permitted to pass through this bridge and established arbitrary horsepower requirements. Work is now in progress to establish a VTS at Berwick Bay for the protection of this bridge. Regulations will be developed for this VTS which will draw on the experience gained with the Special Navigation Orders. Efforts to establish criteria for tow boat power related to the ability to control barges, as called out by the N.T.S.B. report in 1972, have not thus far met with success. The Coast Guard is pursuing solution in two ways: research and development efforts in progress are addressing vessel maneuverability, of which power related to tonnage is a significant consideration; and, the problem has been referred to the Towing Industry Advisory Committee to the Marine Safety Council for an empirical solution based on industry practice.

Other measures the GAO discussed which may improve vessel safety are the requirement for drawbridges to be equipped with bridge-to-bridge radio telephone (VHF-FM Channel 13, 156.65 MHz), and the requirement for vessels to have on board some form of precision navigation equipment. The Coast Guard has been generally successful in its efforts to have bridge owners voluntarily equip draw bridges with bridge-to-bridge radiotelephone. Furthermore, in order to address those bridges which have not been so voluntarily equipped, the Coast Guard has sought legislation which would require the bridge owner to install this equipment at the same time bridge protective systems (fendering) are constructed or altered. Loran "C" may prove to be the suitable form of navigation equipment suggested in the report. The Coast Guard has no plans at this time to require Loran "C" to be carried on certain classes of vessels. If the necessary study of this matter should indicate the installation of Loran "C" equipment should be required, regulations towards this end may be developed under the Act.

Recognizing the overall scope of the work of drafting regulations which lies ahead, the Coast Guard is undertaking the development of a

comprehensive Ports and Waterways Safety Act regulation plan towards this end. In order to assure a uniform understanding of the basis for the development of these regulations and their equitable enforcement, timely guidance will be circulated to the field.

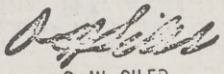
Several errors and inaccuracies have been found in both the GAO Draft Report and final Report. The Comptroller General was alerted to these discrepancies in Appendix C of the DOT Statement on the GAO Draft Report, which was transmitted on January 21, 1975.

IV. STATUS OF CORRECTIVE ACTION

The Coast Guard intends to implement the vessel traffic system program on the basis of cost/benefit considerations and national needs. In keeping with these considerations, and the recommendations of the GAO Report, the next major VTS start is planned for the ICW. Detailed data collection efforts are now underway to identify the marine traffic safety needs more clearly and to help structure a comprehensive approach which will address the entire area most cost effectively. The VTS needs of Chesapeake Bay, an area which the GAO Report recommended for VTS implementation, are presently under study at the local level. By July 1, 1975 the Commander, Fifth Coast Guard District expects this examination along with system recommendations to be complete.

While the Coast Guard's position concerning implementation through a strict phased approach has been previously clarified, analyses of operational effectiveness will be conducted annually for each of the systems. After the selected level(s) has been established and in operation, such analyses will be used to identify the need for possible system upgrading and modification.

For the most part, the GAO Report's Recommendation concerning the promulgation of regulations under the Ports and Waterways Safety Act of 1972 is concurred in. Efforts are underway to identify those aspects of marine safety which lend themselves to universal regulatory treatment. As such problem areas are identified, nationwide direction to field units will be provided by Coast Guard Headquarters. In other instances, the peculiarity of local conditions will require local regulatory remedies. In any case, greater emphasis is being given to marine safety regulations, and recent headquarters staff augmentation should expedite the entire process.



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

OIL TRANSPORTATION BY TANKERS: AN ANALYSIS OF MARINE POLLUTION AND SAFETY MEASURES

CONGRESS OF THE UNITED STATES
OFFICE OF TECHNOLOGY ASSESSMENT

JULY 1975

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Chapter I. Summary of Findings

Recent estimates are that one-third of all oil pollution of the world's oceans is caused by activities generally characterized as "marine transportation." Tankers understandably are the single largest contributor of such pollution.

The pollution damage threat from any vessel to ocean ecosystems and surrounding environments is serious and substantial. Both short term and long term effects of oil pollution have been assessed, resulting in general agreement that oil spills must be reduced from their present level.

The world tanker fleet has greatly expanded in recent years principally through a major use of supertankers which now number 623 ships totaling 127 million dwt or over one half of the world tanker tonnage. An equivalent number of supertankers are now under construction throughout the world.

The expected introduction of supertankers into U.S. waters exacerbates public concern about pollution of the oceans. Inherent in this concern are questions of the safety of operation of supertankers, the adequacy of their port facilities, the qualifications of the crews that operate them and various operating practices that cause pollution. Further, the large number of smaller tankers operating in U.S. ports, which carry both imported and domestic oil, pose a pollution threat from much the same causes. The overall effect of small tankers in congested ports may be even more extensive than that from supertankers, and the relative damage potential needs clarification.

Oil pollution from tankers originates from two principal sources: (1) tanker accidents, and (2) normal tanker operations, such as tank cleaning, de-ballasting, and other operational reasons for periodically discharging oil overboard. The total of oil spillage into the oceans from tankers of all sizes has been estimated from statistics collected on worldwide operations. Some 1,000,000 tons a year are dumped in standard operations while about 200,000 tons per year of oil is spilled by tanker casualties. In addition, an added 250,000 tons of oil pollution annually is associated with tanker drydocking activities.

There are numerous improvements that could be made to reduce oil pollution from tankers and to increase the safety of their operations. Some of these improvements have been proposed in the past, some have been adopted in practice by certain segments of the industry,

and some are new proposals by either industry or government. The improvements highlighted in this report relate to those subjects covered by oversight jurisdiction under the Ports and Waterways Safety Act of 1972, which provides the basic U.S. authority for tanker regulations.

Tanker pollution and safety must also be considered in light of the overall need for efficient and effective methods of transportation of petroleum to the United States (imports) and within the United States (domestic). While supertankers appear to offer one of the most efficient and economical means of transporting oil over long distances, these mammoth ships may also present risks to coastal areas and possible adverse impacts which should receive careful consideration.

Pollution and safety issues are often subject to considerable debate regarding accuracy and extent of data, understanding of the effects of pollution, the evaluation of hazards and impacts, the effectiveness of various technical improvements, and the resolution of conflicting expert views on the effectiveness of regulations.

The following principal findings are related to reducing tanker-caused pollution of the oceans and improving the safety of tanker operations:

Pollution Prevention and Safety Data

- More, and more accurate, worldwide data are urgently needed on tanker-caused oil spills and accidents in general.
- Additional research is needed on the environmental effects of various levels of oil pollution.

Technical Improvements

- It is necessary to treat the oil pollution problem on a total systems basis in order to make meaningful improvement.
- Fitting double bottoms or double hulls on tankers offer a significant degree of protection from oil pollution in the event of grounding and/or collision accidents.
- Inert gas systems can substantially reduce risks of tank explosions and resulting major casualties.
- Improved maintenance, inspection and survey procedures can help alleviate tanker structural failure problems.
- A substantial portion of tanker accidents are caused by human error and improvements in the training and licensing of shipboard personnel are greatly needed.
- Vessel traffic systems and other navigational aids are also in need of continual upgrading and improvement.

Regulations

- The International Pollution Convention of 1973 provides some major improvements in the regulation of tanker-caused pollution worldwide and deserves U.S. efforts to ratify.
- The Ports and Waterways Safety Act of 1972 provides authority to the U.S. Coast Guard for certain regulatory action independent of international treaty, if necessary.
- The National Transportation Safety Board needs to have more autonomous investigative authority than now exists in the case of marine accidents.

* * *

The following discussion expands on the major points highlighted above and presents some of the conflicting views; the subsequent chapters of this report will further develop detailed background information on tankers, the bases for concern on pollution and safety issues, a range of technical approaches for making improvements and the basic international and domestic regulatory authority.

A. Pollution Prevention and Safety

The lack of quantity and accuracy of oil spill data is especially true of oil discharges caused by normal ship operations, for which estimates have been made by extrapolating from that small sample of ships which report their activities. An effort to accurately identify sources, locations and amounts of tanker-caused oil spills would be of significant benefit to all.

Another finding is that more research is needed on the environmental effects of various levels of oil pollution. Coupled with an accurate assessment of status and trends of spills, a more complete analysis of the pollution damage to be expected from various spills could also clarify the issue. The long term effects of pollution on the marine environment have been widely debated but with only limited specific investigations as references. Chapter III discusses the issues of pollution and effects in some detail as well as general safety requirements.

B. Technical Improvements

The improvements which could be effected in the tanker transportation system can be categorized in relation to (1) the ship, (2) the crew who operates the ship, (3) the information and control systems, and (4) the environmental influences. These are discussed in detail in Chapter IV. A series of such technical improvements may, in total,

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provide the measures needed to significantly reduce tanker-caused oil spills. The following improvements are proposed:

1. Double Bottoms/Double Hulls

Many previous investigations have provided a background of varying results regarding the absolute pollution prevention effectiveness of double bottoms or double hulls on tankers. From a technical standpoint, however, it is generally accepted that double bottoms will prevent most oil spillage which results from limited intensity hull ruptures due to groundings, such as those which may occur within harbors or other areas where tankers normally operate at reduced speeds. For double hull tankers, the same may apply for collisions as well as groundings.

This report supports the finding that double bottoms offer a significant degree of protection from oil pollution in the event of a grounding accident.

The added costs and extra safety of tankers fitted with double bottoms are also discussed. It was found from the construction of several new double-bottom oil tankers that the added cost of the double bottom is in the range of 2.5–4.0 percent—significantly less than previous estimates—and that the presumed associated safety problems either do not exist or can be alleviated with proper design.

This report also recognizes that other locations of segregated ballast tanks, when properly designed to act as defensive spaces, may also offer degrees of protection from oil pollution. In the case of double sides, only collision protection is provided; however, this may be of special value where there is a low grounding potential but a high risk of collision. Double hulls, which incorporate both double bottoms and double sides, offer protection from oil pollution from both groundings and collisions.

2. Controllability

Controllability problems associated with tankers (especially supertankers) are discussed in Chapter IV. It is generally accepted that the need for attention to control problems, especially for ship operation in confined waters, rises as the size of ship increases. Stopping and low speed maneuvering of supertankers require both a better understanding of ship control characteristics and better knowledge of local port conditions. It appears that the use of tugboats and auxiliary maneuvering devices could be more carefully designed into all tanker operations. Another finding supported by this report is that additional research into large ship controllability would be most desirable.

3. Inert Gas Systems

It is generally agreed that the use of inert gas systems to substantially reduce the risk of tank explosions is an extremely beneficial design feature for tankers. Chapter IV discusses the need for and use of these systems. Many tankers are now fitted with these. The finding is supported that inert gas systems are of substantial benefit in large tankers and may be of significant benefit in smaller crude and product tankers as well.

4. Maintenance

This study supports the finding that hull structural failures in some tankers—especially those over ten years old and those which may not have been carefully maintained—are the cause of a substantial amount of oil spilled each year. In addition, many of these hull failures result in complete break-up of the ship and the loss of many lives as well as the cargo. It is suggested that special inspection procedures for older tankers may alleviate some of these problems. It is also suggested that converting conventional tankers to segregated ballast tankers with a resulting decrease in cargo capacity may offer several advantages.

5. Personnel Training and Licensing

There is substantial agreement that human error is a major factor contributing to all tanker accidents (especially groundings and collisions) and that improvements in this area have the potential of providing the most significant benefits. Chapter IV discusses a broad range of possible improvements in the training and licensing of shipboard personnel. Training and licensing practices appear to be more crucial as the size of a tanker increases because of the increased threat of a major accident.

6. Information and Control Systems

A broad range of systems to provide better information for the navigation and control of tankers (and other surrounding ships as well) is considered to be a very beneficial safety feature. The systems available and proposed are described in Chapter IV. It is noted that navigational aids could be improved in many areas, and that vessel traffic systems, collision avoidance systems, improved communications systems and shipboard control itself are all areas in need of continual upgrading and improvement.

C. Effectiveness of Regulations

Chapter V discusses the legal and jurisdictional aspects of tanker regulation and control. Both international and national laws apply to the operations of tankers in U.S. waters. Since 94 percent of the imports of oil to the United States is carried by foreign flag tankers, international regulations are of particular interest. It is also noted that the new regulations for tanker design and construction, proposed to be promulgated soon by the U.S. Coast Guard, are substantially the same as international agreements on the subject. However, the United States possesses sufficient legal authority to set more stringent standards.

In addition to steps which may be necessary to implement the improvements outlined above, this report also supports the finding that the International Pollution Convention of 1973 can enable several major improvements in the regulation of tankers toward substantially reducing worldwide oil pollution. There are conflicting views, however, on the ability of any international agreements with Flag State enforcement (given the nature of flag and ownership of world tanker fleets) to effectively control tanker operations. Given that fact that many other international treaties have taken many years to be ratified, it is felt that this one may also be delayed beyond a reasonable time. It is generally agreed, however, that U.S. efforts to ratify, and to encourage other nations to ratify, the 1973 Pollution Convention will be of benefit to all. A possible exception to this position has been expressed by some environmental groups who claim that an international agreement may not be desirable if it reduces our ability to make improvements unilaterally.

The Ports and Waterways Safety Act of 1972 provides authority to the U.S. Coast Guard to take certain actions independently of international treaty, if necessary, as well as to develop tanker regulations on the basis of the best available pollution control technology for the protection of U.S. waters.

In conjunction with other subjects studied and presented in this report, the area of accident investigation was reviewed and some possible improvements are suggested here. The National Transportation Safety Board investigates major accidents at the request of the U.S. Coast Guard and makes recommendations regarding problem areas. It should be noted that the 1974 amendments to the Federal Railroad Safety Act, addressing the question of NTSB autonomy, required that it no longer be within the Department of Transportation, but rather be an independent agency by April, 1975. This same act, however, did not change the dual relationship in marine accidents of

NTSB and the USCG. Thus, although the NTSB is established as an independent Federal agency to make unbiased investigations of transportation accidents in all fields which are of significant impact or of national interest, it may investigate marine accidents only upon request of the U.S. Coast Guard—and then only after the Coast Guard has completed an initial inquiry.

The Coast Guard has operational responsibility for traffic control systems, licensing of operators or approval of ship safety standards. Therefore, it is sometimes placed in the position of having to expose deficiencies in its own operations while investigating marine accidents. An agency such as NTSB could relieve the Coast Guard of these "self policing" burdens and provide both the Congress and the Executive branch with findings and recommendations outside of Coast Guard jurisdiction.

It is also recognized that more detailed information on major accidents worldwide could provide valuable data for analysis of causes and effects. NTSB or some other appropriate agency could possibly investigate significant accidents throughout the world as well as within U.S. waters with the objective to develop a better understanding of those factors that contribute to such accidents.

TABLE III–1.—*Summary of oil pollution inputs in the world's oceans caused by tankers*

Cause:	*1973 estimated annual input (tons)*
Tanker operational spillage caused by tank washing and ballast water discharge: 75 percent by tankers without a load-on-top system and 25 percent by tankers with L.O.T	1, 080, 000
Tanker accidents	200, 000
Tanker drydocking	250, 000
Tanker terminal operations	3, 000
Tanker bilges and bunkering	50, 000
Total [1]	1, 583, 000

[1] This total is equivalent to nearly ½ billion gallons of oil each year.

Source: "Petroleum in the Marine Environment," National Academy of Sciences, January 1975.

TABLE III–2.—*Estimate of oil pollution input to the world's oceans from all sources*

Budget of Petroleum Hydrocarbon Introduced into the Oceans

Source	Input rate (millions of tons per year) Best estimate	Probable range	Reference
Natural seeps	0. 6	0. 2–1. 0	Wilson et al. (1973).
Offshore production	. 08	. 08–. 15	Do.
Transportation:			
LOT tankers	. 31	. 15–. 4	Results of workshop panel deliberations.
Non-LOT tankers	. 77	. 65–1. 0	
Dry docking	. 25	. 2–. 3	
Terminal operations	. 003	. 0015–. 005	
Bilges bunkering	. 5	. 4–. 7	
Tanker accidents	. 2	. 12–. 25	
Nontanker accidents	. 1	. 02–. 15	
Coastal refineries	. 2	. 2–. 3	Brummage (1973a).
Atmosphere	. 6	. 4–. 8	Feuerstein (1973).
Coastal municipal wastes	. 3	–	Storrs (1973).
Coastal, nonrefining, industrial wastes.	. 3	–	Do.
Urban runoff	. 3	. 1–. 5	Storrs (1973), Hallhagen (1973).
River runoff	1. 6	–	Do.
Total	6. 113		

Reproduced from: "Petroleum in the Marine Environment," National Academy of Sciences, January 1975.

A REPORT TO CONGRESS

ACTIVITIES RELATING TO TITLE II PORTS AND WATERWAYS SAFETY ACT OF 1972

JANUARY 1977

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

REPORT TO CONGRESS

A. Description of the rules and regulations prescribed by the Secretary.

i. Rules to improve vessel maneuvering and stopping ability and otherwise reduce the possibility of collisions, groundings, and other accidents.

Final regulations requiring the posting in the pilothouse of the individual maneuvering and stopping characteristics of ships for 1,600 gross tons and over were published in the Federal Register on 15 January 1975 (40 FR 2689) and was reported in the fourth Title II Report to the Congress, dated January 1976. Since that time, the Coast Guard has been exploring additional related methods of reducing risk.

A notice of proposed rulemaking entitled "Navigation Safety" was published in the Federal Register on 6 May 1976 (41 FR 18766) which prescribed navigation practices as well as equipment and testing requirements for all vessels of 1,600 gross tons and over when operating on the navigable waters of the United States, except the Panama Canal and St. Lawrence Seaway. The purposes of these rules are to prevent vessel collisions and groundings

and protect the navigable waters from environmental harm resulting from vessel collisions and groundings. These rules are contained in Appendix I of this report. We anticipate publishing these regulations in final form during the first quarter of calendar 1977.

A system analysis approach to the reduction of the possibility of collisions, groundings, and other accidents and to the improvement of maneuvering capability has been initiated. The effort is progressing along three avenues of endeavor:

1. Human performance analysis in the marine domain.

2. Vessel system performance analysis in the marine domain.

3. Analysis methodology development.

Progress and results, to date, in each of the above areas are as follows:

a. Human Performance

An analysis of marine accidents by the Coast Guard, as well as other agencies 1/, has shown that human error plays a

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1/ National Academy of Science, "Human Error in Merchant Marine Safety," Washington, D.C., June 1976

dominant role in the chain of events leading to a marine accident. For this reason the Coast Guard is attempting to gain more precise knowledge about the interactions between the human "controller" and the vessel system in the marine domain. Two studies were completed in this area. The first concerned an investigation of piloting practices on board U.S. vessels entering ports in this country. This investigation was to assess the feasibility of identifying and obtaining data useful in the identification of sources of information or cues used by pilots in navigating a vessel. The next step was to study the manner in which this information is processed and then presented to determine precisely how the processing and presentation relates to the pilots' ability (or inability) to safely navigate a vessel. The second study concerned functional job analysis of all merchant vessel control tasks to identify the human factor aspects of tanker/freighter and towboat control functions.

The results of these studies have not been completely evaluated, but they do represent a first step in the development of the body of knowledge required for the analysis and determination of the cause of collision, ramming and grounding accidents.

b. Vessel System Performance

Not all marine accidents are due to human error. A mismatch or failure in the other subsystems (cargo, pathway,

propulsion, steering, etc.,) can also cause accidents that damage the environment. In general, it is possible to state that both the human controller and the other system elements must perform within a specified level in order that the probability of a collision, ramming or grounding accident remains within an acceptable range. The performance boundaries for either the human or the other system elements that provide an acceptable probability or risk level are not known. The Coast Guard is attempting to acquire the basic information needed to establish appropriate performance boundaries. Examples of the research bearing on this part of the problem are briefly described below.

The first effort concerns an analysis of collisions with bridge structures. The purpose of this study is to investigate bridge accidents by examining accident reports, waterway characteristics, bridge configurations, environmental conditions, and any other information which might be helpful, in the attempt to determine the causes of collisions with bridge structures.

Another research project concerns the investigation of maneuvering characteristics and stopping performance of tank vessels. This investigation included:

1. The development of a mathematical model to represent vessel maneuvering motion.

2. The collection of vessel hydrodynamic data and vessel parameters.

3. Vessel motion prediction through simulation by means of the mathematical model.

The equations of motion and hydrodynamic coefficients were developed for a typical medium-size tanker. Maneuvering simulation experiments have provided data which show good correlation between maneuvering motion predictions and full-scale trial results.

Another project related to vessel system performance is one that involves the analysis of the reliability and maintainability of the critical vessel subsystems. Present efforts underway involve analyses of steering subsystems. In essence, the objective of this effort is to determine the requirements for assurance of acceptable reliability and availability levels for vessel steering systems.

c. Analysis Methodology Development

Once the knowledge and data developed in a. and b. above are available, we will be able to explore scenarios to determine

alternatives to reduce the probability of collisions, rammings, and groundings. A mathematical model is being developed combining all the above inputs for analysis.

ii. To reduce cargo loss in the event of collision, grounding, and other accidents.

In the 1976 Title II Report to Congress, the Coast Guard reported that a Notice of Proposed Rulemaking had been published proposing strategic location of segregated ballast areas in certain tank vessels to minimize the outflow of cargo in case of a collision or grounding. The Coast Guard published final rules in the Federal Register of 8 January 1976 (41 FR 1479), which are contained in Appendix II of this report. These rules outline design configurations that have been found to be superior to other configurations in mitigating cargo outflow.

Five research projects are in progress in the area of Structural Failure Prevention. The first project concerns collision damage resistance. The intent of this investigation is the evaluation of phenomena that contribute to the ability of a longitudinally framed ship, such as a tanker, to withstand a minor collision.

The second project concerns the evaluation of interim repairs to tank barges. A series of selected repairs and repair materials were tested in a laboratory. The purpose of these tests was to develop a ranking of the repairs in order of their relative survivability for each test conducted. The test examined impact, hydrostatic pressure, chemical immersion, and heat values.

The third project concerns the enhancement of the analysis of structures. The analysis is highly complex and uses a computer to mathematically model the physical description of the structure to be analyzed. The results provide the response of the structure to various loadings. In the past, the analysis of one problem typically required the expenditure of about six man weeks of effort due to the volume of paper containing data to be worked over. The project has enhanced the previous method, called finite element analysis, to incorporate further analysis in the computer producing a pictorial form of output. This is known as a graphics orientated finite element analysis (GIFTS). The additional step has reduced the time for a typical structural analysis from the previous six weeks to two days.

The fourth project is concerned with longitudinal strength criteria for Great Lakes vessels over 750 feet long. This investigation centered on stress data collection, analysis and a computer model.

The fifth project deals with liquefied natural gas (LNG) cargo tank design. The intent of this project is to develop a procedure to predict the extreme loading value to be accounted for in the design of the cargo tanks in LNG vessels. The extreme loading values can be obtained after the complex determination of the varying values for the cargoes' acceleration factors, due to ship motion, are predicted. Extreme values of acceleration for the lifetime of a ship are obtained by using a computer program applying short-term statistics to extreme sea condition data collected over many years. Predicted extremes are compared with the suggested (1 October 1972) Chemical Transportation Industry Advisory Committee (CTIAC) design rules. Generally the prediction procedure is used to provide reasonably conservative extreme accelerations appropriate to the design of LNG cargo tanks.

The Coast Guard is also maintaining active participation in the interagency Ship Structures Committee which serves as a focal point for the structure related research conducted by the Navy, Maritime Administration, American Bureau of Shipping, and the Coast Guard.

In the area of flooding, capsizing and foundering, there are currently two research projects that will provide inputs to Title

II regulations. One project is concerned with wave group analysis and capsizing simulations which will be used to develop analytical techniques for predicting the conditions under which a vessel will capsize. This technique will be used to develop sound design standards that will minimize pollution caused by release of shipboard cargoes due to capsizing. The second project is concerned with the damage stability of cargo ships. The purpose of this study is to determine if the presently assumed permeability values for cargo spaces of barge carrying ships and for engine rooms of all ships are valid in doing damage stability calculations on modern vessels. Preliminary results indicate that damage stability standards may have to be revised both internationally and nationally.

In the area of cargo system safety research, the Coast Guard has many current projects that will contribute useful inputs. A review of these projects was presented in the Sixth Annual Report of the Secretary of Transportation on Hazardous Materials Control, 1975, pursuant to Title I, Public Law 93-633.

iii. To reduce damage to the marine environment from normal operation of vessels to which this Title applies.

In the Fourth Title II Report, dated January 1976, the Coast Guard reported on the preparation of proposed rules applicable not only to U.S. vessels but also to foreign vessels entering U.S.

waters. These proposed rules were published in the Federal Register on 15 April 1976 (41 FR 15859) and are contained in Appendix III of this report. These regulations add design, equipment, and operation requirements for sea-going U.S. flag tank vessels (of 150 gross tons or more) engaged in foreign trade and foreign flag tank vessels (of 150 gross tons or more) that enter the navigable waters of the United States. A final environmental impact statement (EIS) on regulations for "U.S. Tank Vessels Carrying Oil in Foreign Trade and Foreign Tank Vessels that Enter the Navigable Waters of the United States," was filed 1 November 1976 with the President's Council on Environmental Quality. The final EIS is included as Appendix IV of this report. A copy of the currently unpublished final rule is attached as Appendix V; publication is in process, scheduled for 13 December 1976.

In addition, on May 13, 1976, the Coast Guard published in the Federal Register an advance notice of proposed rulemaking soliciting comments on the concept of requiring certain existing tank vessels to retrofit a segregated ballast capability. The nearly 100 written comments raised many serious questions and subsequently the Coast Guard contracted for an in-depth study of some of these implications. This study has not been completed yet and therefore no decision has been reached regarding whether to proceed or withdraw the proposal. This issue is also under discussion presently within the Marine Environmental Protection Committee of IMCO.

83-526 O - 77 - 16

The Coast Guard is continuing research to provide the United States with approval regulations for oil-water separators, oil content monitors, and oil content alarms which are consistent with international regulations for such equipment. Results to date include draft approval regulations that will be published as proposed rules during the first quarter of 1977.

B. Progress made with respect to adoption of international standards for design, construction, alteration and repair of tank vessels for protection of the marine environment.

The Coast Guard continued to participate in the work of the Intergovernmental Maritime Consultative Organization. The IMCO Marine Environment Protection Committee met on two occasions during the year. Items on that Committee's work program of particular significance to Title II are:

(a) Segregated Ballast on Existing Tankers.

(b) Development of Standards for Oily-Water Separating Equipment and Oil Content Meters.

(c) Development of Guidelines for the Provision of Reception Facilities.

(d) Review of Technical Problems Associated with the Implementation of the 1973 Convention.

The Committee is giving detailed consideration to each of the items and it is expected that items (b) and (c) will be finalized during the coming year.

The first meeting of the new IMCO Subcommittee on Bulk Chemicals was held during the year. The Subcommittee is chaired by the United States (represented by the Coast Guard) and is unique in that it reports to two Committees, the Marine Environment Protection Committee and the Maritime Safety Committee. The Subcommittee is responsible for carrying out the IMCO work concerning the transportation of bulk dangerous cargoes including both liquids and gases. Its work program includes responsibility for the IMCO Codes for the Construction and Equipment of Ships Carrying Bulk Dangerous Chemicals and Bulk Liquefied Gases as well as any work related to Annex II of the 1973 Convention.

During the first session, the Subcommittee on Bulk Chemicals completed a Code for the Construction and Equipment of Existing Gas Ships. The Subcommittee also began work on the items of its work program related to pollution. These are:

(a) evaluation of noxious substances,

(b) preparation of guidelines for the provision of reception facilities required by Annex II of the 1973 Convention,

(c) preparation of procedures and arrangements for the discharge of noxious liquid substances in accordance

with Annex II of the 1973 Convention.

Other IMCO bodies continued their work on items related to the improvement of the safety of vessels. Most notable are the Procedures for the Control of Ships developed by the Maritime Safety Committee. These procedures are directed at identifying substandard ships so that appropriate action can be taken. The Maritime Safety Committee also developed a procedure for including the amount of segregated ballast on the tonnage certificates of tankers meeting the 1973 Convention so that authorities may take it into account when determining the vessel's various port fees.

The Coast Guard has fully supported the work of the above mentioned IMCO bodies as well as all others during the past year. In developing our national inputs into the IMCO work, the Department of State Shipping Coordinating Committee as well as Coast Guard Advisory Committees have been utilized to the fullest extent. The work has also been fully coordinated with the Environmental Protection Agency and MARAD, and often representatives of those agencies have participated as members of the U.S. delegations to the IMCO meetings.

Two sets of regulations, applicable to flammables and combustibles, were issued as proposed rulemakings under the authority of Title II of the Ports and Waterways Safety Act.

Proposed rules for the Carriage of Bulk Dangerous or Extremely Flammable Liquid Cargoes on self-propelled vessels were published in the Federal Register of Thursday, June 24, 1976 (41 FR 43822). These rules are contained in Appendix VI.

The purpose of the rulemaking is to:

a. Improve the safety of new and existing ships, U.S. flag and foreign flag, carrying bulk dangerous chemicals in U.S. waters.

b. Adopt the recommendations of IMCO's Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (Resolution A. 212[VII]).

Proposed rules for Self-Propelled Vessels Carrying Bulk Liquefied Gases were published in the Federal Register of 4 October 1976 (41 FR 26126). These rules are contained in Appendix VII.

The purpose of the rulemaking is to:

a. Improve the safety of new liquefied gas carriers. The regulations apply to foreign flag vessels

operating in U.S. waters, as well as U.S. flag vessels.

b. Adopt the recommendations of IMCO's Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Resolution A. 328[IX]).

C. To the extent the Secretary finds standards with respect to the design, construction, alteration and repair of vessels for the purpose set forth in A.i, ii, or iii above not possible, an explanation of the reason therefore.

We have found no areas where we cannot implement required rules and regulations, but we realize that the progress defining rules and regulations for maneuverability and the reduction of the possibility of collisions, groundings and other accidents are moving very slowly because of the complexity of the problem, as has been previously reported.

D. Other Coast Guard Activities Related to the Act.

a. Marine Safety Systems Analysis, consisting of:

(1) A threefold Commercial Vessel Safety Project to develop procedures for estimating costs to affected parties arising from Coast Guard regulatory actions, the evaluation and application of risk assessment methodologies, and the development of a methodology for quantifying the benefits from reductions of marine casualties.

(2) A two-part Port Safety Project to develop a guide for siting of facilities and marine terminals, and a review of methods and practices used by other agencies and governments to improve resource management within the Port Safety Program.

b. Marine Safety Information System

(1) A project is under development to design a computerized Management Information System to serve the diverse needs of the Coast Guard's marine safety efforts. Within the framework of this system is the ability to develop and analyze safety profiles for different class vessels.

c. Personnel Qualifications and Training

In a continuing effort to provide for the protection of the marine environment, regulation changes are being proposed in regard to the licensing and certificating of merchant marine personnel which will establish qualifying criteria for certifying candidates for the carriage and transfer of various categories of dangerous cargoes.

In order to reduce pollution incidents caused by human error, the Coast Guard is proposing that licensed officers no longer be tankermen by virtue of holding a license but must have qualifying training and experience before they may perform service involving transfer of dangerous cargoes. Deck and engineer officers and unlicensed personnel would have to show qualifying service and complete an approved training course, or pass a written Coast Guard examination in order to qualify for the endorsement as 'Tankerman."

Firefighting training will be required for all persons desiring to be certificated as "Tankerman." In addition, applicants for a tankerman endorsement for other than flammable and combustible liquid cargoes must complete a tankerman training course for the endorsement of the cargo desired.

The Coast Guard has recently completed two studies relating to personnel qualifications. These studies are being used in conjunction with establishing guidelines for the development of tankerman courses and evaluation of the courses for Coast Guard approval.

The first study is entitled "Recommendations for Qualifications of Liquefied Natural Gas Cargo Personnel." This study consists of three volumes; volume I is an introduction, while the second and third volumes deal with functional job analysis of tasks for personnel associated with operations of cargo ships and unmanned barges carrying liquefied natural gas.

The second study is entitled "Qualifications Standards for Personnel Responsible for Hazardous or Noxious Chemicals in Bulk." This study is also published in three volumes and, as in the previous one, the first volume is an introduction while the second and third deal with functional job analysis of tasks relative to personnel.

These studies provide a sound basis for the Coast Guard review of schools providing training of personnel in firefighting and hazardous material handling techniques. The schools are invaluable for qualification of seagoing personnel in dealing with the

technological advancements and cargoes representative of today's merchant marine.

d. Marine Investigation

New and additional emphasis has been placed on investigations by finalizing the formation of a division at Coast Guard Headquarters in the Office of Merchant Marine Safety, which is solely dedicated to investigating marine casualties and personnel actions. This reorganization will enable more effective utilization of resources to permit review of a greater number of casualties and an improvement in the thoroughness of review of each report received. The net result of this effort will be to develop the casualty data bank into a more reliable means of identifying causes of marine casualties and the most prudent corrective and preventative actions.

e. Merchant Vessel Inspection

The Coast Guard has published notices of proposed rulemaking as follows:

1. Proposed rules to implement amendments to Regulations 12, 19, and 20 of Chapter 5 of the International Convention for the Safety of Life

at Sea, 1960. These proposed amendments, attached to the 1976 Title II Report to Congress, were an outgrowth of a study by IMCO of the disastrous Torrey Canyon foundering on 18 March 1967. The amendments will require vessels of 1,600 gross tons and over in ocean and coastwise service to be fitted with a radar, radio direction finding apparaturs, gyro compass, and echo sounding device. Conditions of vessel operation while under the control of an automatic pilot are also specified. In addition to the specific navigational equipment requirements for vessels of 1,600 gross tons and over, all ships subject to the International Convention for the Safety of Life at Sea, 1960, must carry adequate and up-date charts, sailing directions, lists of lights, notices to mariners, tide tables and other nautical publications necessary for the intended voyage. The final rules are presently in preparation.

2. The Coast Guard published proposed regulations in the Federal Register on 13 August 1976 (41 FR 33996) prohibiting the accumulation of cargo in cargo handling rooms and prohibiting the installation of

air compressors in cargo handling rooms and cargo areas. These proposed rules were issued following the Commandant's Action on the Marine Board of Investigation of the SS TEXACO NORTH DAKOTA. The Commandant's action concluded that cargo that leaks or is drained or spilled into a pump room bilge poses a hazard to the vessel and its personnel and makes the operation of an air compressor in the pump room hazardous. It has been determined further that cargo that leaks or is drained or spilled into a bilge of any cargo handling room poses a hazard and that operation of an air compressor in or adjacent to any cargo area on a tank vessel likewise poses a hazard. Comments have been received concerning the proposed rules, which are included as Appendix VIII to this report, and final rules are currently being drafted.

3. A formal investigation into the explosion and fire on board the tank barge ATC 3060, O.N. 512289, which occurred on 17 March 1975, revealed that proper identification of the grade of cargo transferred to the barge from the SS AMOCO YORKTOWN (of Liberian registry) could have alerted the repair

crew aboard the barge to the inherent dangers associated with carriage of the cargo. Information concerning the grade of cargo being transferred could have been obtained from the shipping papers. Consequently, the Coast Guard has issued proposed rules making certain portions of the tank vessel regulations applicable to foreign flag tank vessels. The section proposed to be applicable to foreign tank vessels is 46 CFR 35.01-10. It speaks to required shipping documents giving the name of the cosignee and location of the delivery point, the kind, grades, and approximate quantity of each kind and grade of cargo, and for whose account the cargo is being handled. These proposed rules were published in the Federal Register Thursday, September 2, 1976 (41 FR 37119) and are attached as Appendix IX, to this report.

F. Fire and Explosion Prevention and Protection

Research and Development efforts in fire and explosion prevention are continuing. There have been several projects conducted. The largest project concerned an assessment of "Fire Safety Aboard LNG Vessels." The primary purpose of the program

was to examine in detail the current recommendations compared to best estimates for credible fire.

Another significant project concerned "Chemical Fire Hazard Analysis" which developed a methodology to examine potential fire problems in cargoes of particular hazard. The end result of the effort will be the testing of the methodology in order to utilize it in a regulatory format. Research efforts also verified international design parameters for installation of high expansion foam systems for fire protection of vessel machinery spaces.

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