

# ISSUES AND OPTIONS

## INTRODUCTION

This study has assessed the social, political, institutional, environmental, and economic effects of offshore oil and gas, deepwater ports, and floating nuclear powerplant technology on the coastal zone of New Jersey and Delaware. The potential effects in this one region have been used to illustrate those public policy issues which are of significant concern to Congress and the Nation.

OTA found that each of the three technologies studied posed different problems and benefits for the area and that little cumulative effect could be expected even if all three were to be deployed simultaneously.

There was, however, one issue which was raised by all three of the technologies: the possibility of increasing and diversified use of the oceans in the future without any formal mechanism for planning development, identifying priority ocean uses, and resolving conflicts among an increasing number of users.

This chapter discusses this common issue, eight issues pertaining to the development of oil and gas resources, four pertaining to deepwater ports, and four pertaining to floating nuclear powerplants. Analyses of these issues have been used to develop policy options which Congress may wish to consider for resolving some of the problems identified. These policy options have been reviewed by industry and pertinent government agencies and their comments have been considered prior to preparation of this final report.

The comments quoted in the margins of the Issues discussions reflect the view of citizens who joined in the public participation segment of this study and the views of State and Federal officials who reviewed the work for OTA.

# Offshore Priorities and Planning

Future deployment of ocean technologies on a large scale could create serious conflicts among users and impose excessive burdens on ocean and coastal environments unless a system for setting priorities of use and for zoning ocean areas, much as land areas now are zoned, is established.

## FINDINGS

1. Decisions about the most appropriate uses of the oceans now are left to the individual judgments of private citizens and companies and the several Federal agencies that have jurisdiction over some phase of ocean activities.

2. There is no formal mechanism for resolving conflicts among the many users of the ocean or for directing research to discover the cumulative environmental consequences of expanding use of the oceans.

## DISCUSSION OF THE ISSUE

In normal operation, none of the three offshore energy systems addressed in this study is likely to impose intolerable burdens on either the ocean or coastal environment, singly or in combination. Conflicts between these new systems and traditional users of waters off New Jersey and Delaware probably can be resolved with appropriate vessel traffic control systems and methods of coordinating oil development and fishing operations.

If such offshore programs as floating nuclear powerplants prove workable, they could lead to deployment of more floating powerplants and other offshore technologies on a major scale.

No priorities now exist for uses of the oceans. No structure, legal or administrative, exists for resolving conflicts among users or for performing research on the long-range and cumulative impacts of expanded ocean use.

Environmental impact statements and public hearings which are required for most ocean licensing provide a forum for identifying some conflicts among ocean uses,



Overall Concern

## Public Participation Comments

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but they seldom identify hard choices among limited ocean resources and ocean uses.

The region's ocean waters have been used for fishing, military operations, and commercial shipping since colonial days. More recently, the ocean has been used for recreation, dump sites, communication lines, and weather stations.

Several other ocean uses have been proposed, either for the near or distant future. One proposal would install wind- or wave-powered generators at sea to generate electrical power. Research and development is underway on methods of using the ocean for controlled development of biological resources as a method to generate increased food and energy supplies. Mining of the Outer Continental Shelf for sand, gravel, and minerals is an existing activity that could be expanded. Several proposals exist for creating artificial islands for heavy industries that, on land, are regarded as "bad neighbors. "

Meanwhile, use of the ocean and its beaches for recreation continues to grow, as do marine research, archeological exploration, and salvage operations.

Many conflicts in ocean use are not confined to U.S. territorial waters. Commercial fishing, shipping, and mining, for example, are international activities that often involve U.S. waters. The Third International Law of the Sea Conference is addressing many marine problems, although its primary mission is to resolve conflicts among nations rather than conflicts among individual users. Some industry organizations and a few international organizations, such as the Intergovernmental Maritime Consultative Organization (IMCO), were created to solve problems between specific ocean activities and other uses that conflict with those activities. IMCO deals primarily with commercial shipping activities. However, no single international group is responsible for an overall view of the potential for future problems.

The following summary of the major historic and future uses of the ocean off Delaware and New Jersey suggests in more specific terms the potential conflicts among ocean users, both domestic and foreign.

#### **COMMERCIAL FISHING**

The Delaware and New Jersey fishing grounds are at the southernmost tip of the North Atlantic fisheries. In

the North Atlantic's broad expanse of offshore waters—which includes the Continental Shelf from Cape Cod to Cape Hatteras—U.S. fishermen caught 1.5 billion pounds of commercial fish and shellfish in 1975, which is almost one third of the total U.S. catch.

Preliminary figures collected by the National Fisheries Service show that commercial fishermen in Delaware and New Jersey grossed \$20 million in 1975, with a catch of more than 150 million pounds.

According to the National Fisheries Service, more than 2,000 New Jersey and Delaware fishing boats provided full- or part-time employment to more than 3,500 persons.

In the Mid-Atlantic, foreign vessels, operating primarily outside the 12-mile national limit, have traditionally caught large quantities of fish. The vessels came from the Soviet Union, Poland, Japan, Spain, Italy, and East and West Germany. Even though the United States has recently enacted a 200-mile fisheries zone, provisions for licensing foreign fishing within this zone are still in the future.

Commercial fishing in this region by both U.S. and foreign fishermen, is likely to continue at the present level without major increases in the future because many of the resources are already utilized to their maximum limit. There will probably be additional activity to restore depleted stocks, to regulate and enforce new management systems for fisheries, and to find new ways to increase productivity of certain species. All of these activities will require the use of more ocean surface and bottom space in areas that might be sought for other uses such as oil drilling or siting of platforms. In addition, surface traffic of fishing vessels, enforcement vessels, and research vessels which tend to stay at sea for longer periods of time could conflict with other surface traffic.<sup>1</sup>

#### **SPORT FISHING**

In 1970, an estimated 1.7 million salt-water sport fishermen in the Mid-Atlantic region generated about \$300 million of business activity, according to a 1970 National Survey of Fishing and Hunting. Sport boats take anglers to search for barracuda, shark, mackerel, bluefish, butterfish, bass, trout, flounder, and croakers in the Continental Shelf waters and beyond for tuna, dolphin, mackerel, and albacore.

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Between Atlantic City, N.J., and Ocean City, Md., the ocean yields white marlin and tuna for sport fishermen.

Based on past trends, interest in sport fishing probably will increase in coming years at a rate higher than actual population growth. Boat traffic will increasingly cause conflicts, especially at the coastal harbors that may also be used for supply boats to support offshore technologies. In addition, land-use pressures may increase in spawning and nursery grounds in the coastal zones, which are utilized by 75 percent of the sport fish at some time in their life cycle. z

### **MERCHANT SHIPPING**

The shipping lanes off Delaware and New Jersey are ocean versions of interstate highways that link Mid-Atlantic metropolitan areas. There are two major two-way traffic lanes into the Delaware Bay, second in the region only to New York Harbor in total cargo handled.

One route is designated by the International Maritime Consultative Organization of the United Nations as the recommended lane for traffic in and out of Delaware Bay. However, only U.S. flag ships are forced by the U.S. Coast Guard to comply with the recommendation and less than half of the ships that call at Delaware Bay are U.S. flag ships. The other route is not recognized by IMCO, but is a well-established traffic lane used heavily by foreign and domestic ships. Many other lanes intersect the recognized lanes.

The ports on the Delaware River and New York Harbor together are probably the most heavily utilized in the United States. They handle over one-third of all imported and domestic oil carried by tankers. Nearly 3,000 major tankers enter and leave each port per year. Total major ship traffic into Delaware Bay is more than 5,000 ships per year and into New York Harbor more than 8,000 per year. Almost 150 steamship liners operate out of the Port of New York alone. Many of these ships are foreign flag (almost all of the tankers carrying imported oil) and traffic problems will undoubtedly increase as other offshore users enter the region. The conflicts are clear between offshore platforms in the Baltimore Canyon, which could be located near some traditional shipping lanes if oil is discovered.<sup>3</sup>

## **OFFSHORE OIL AND GAS**

The scheduled sale of oil and gas leases in the Mid-Atlantic could cause a sharp increase in the number of structures and amount of ship traffic in the ocean off Delaware and New Jersey.

As many as 10 exploratory rigs and 50 production platforms may be working off the Mid-Atlantic coast at one time, along with vessels engaged in exploration, crew transport, supply, platform and pipeline construction. As many as 30 vessels—supply boats, tugs, and crew boats—could be operating in the Baltimore Canyon region by 1980 in direct support of exploration rigs. When and if Baltimore Canyon oil and gas is discovered and activities hit their peak, the number of operating support vessels could increase to over 200 and include construction barges, pipelaying barges, and other varieties of workboats. These uses and resulting traffic will conflict with shipping, fishing, research, recreation, and other surface uses not only offshore, but in the already limited coastal harbors. Oil could be tankered to shore from Outer Continental Shelf production rigs.<sup>4</sup>

## **MILITARY**

A large portion of the Mid-Atlantic Continental Shelf is used by the military for acknowledged and for classified activities. Unclassified military operations in the area include submarine missions, air exercises, gunnery practice, missile and rocket testing, search and rescue drills, oceanographic research, and ocean surveillance. There are also several deepwater dumping grounds for explosives and nuclear waste,

Naval ships and planes, which are most likely to conflict with surface ship traffic, use the area 18 hours a day on weekends. Potential air traffic conflicts are also possible with helicopters that are used to transport crews to offshore platforms.

## **INSTALLATION AND FACILITIES**

The cities of Philadelphia, Pa., and Camden, N.J., and E.I. Du Pont de Nemours and Co. of Edge Moor, Del., dump municipal and industrial waste in two deepwater sites 50 miles southeast of Delaware Bay. The dump sites are designated and monitored by the Environmental Protection Agency.

In 1974, barges made 222 trips from Delaware Bay to the dump sites. Since then, the Environmental Protection Agency has reduced the number of dump permits for the area. Philadelphia, which dumps the largest volume of waste, has been ordered to phase out its dumping by 1980. Because of public opposition to ocean dumping off the resort areas of Atlantic City, N.J., Rehoboth Beach, Del., and Ocean City, Md., it is unlikely that any new major dumping permits will be issued.

Three major transoceanic telephone cables are buried directly east of the New Jersey shore. The cables are buried about 10 feet deep along most of the Continental Shelf. Many conflicts between scallop fishermen, who run dredges over the bottom near the cables, and the telephone company have arisen in the past. New conflicts are possible if and when oil pipelines are added to the seafloor network.

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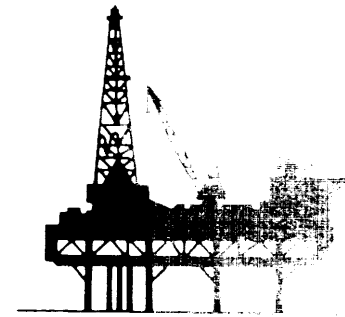
### CONGRESSIONAL OPTIONS

Congress may wish to deal with problems arising from conflicting ocean uses on any of a number of policy levels. It could:

1. Mandate a detailed study of conflicting ocean uses to assemble a data base on present and future uses and suggest priorities for development and control. Such a study could also assess present Federal organizational capabilities to deal with such conflicts and, if appropriate, propose changes, if any, required in the Federal structure.
2. Provide one ocean-related agency with authority to resolve ocean-use conflicts that result from increased offshore activities. Any such delegation of authority probably would have to specify arbitration, public or private, as an avenue for resolving some conflicts.
3. Require joint planning for offshore uses by conflicting parties, public and private, domestic and foreign.

## Federal Management System

Federal management of the offshore oil and gas program is fragmented within the Department of the Interior and coordination with other Federal agencies which share jurisdiction is ineffective.



Oil and Gas

### FINDINGS

1. The Department of the Interior, in its OCS management role, must coordinate elements of development which involve 4 cabinet-level departments, 15 subcabinet and independent agencies, 22 State governments, and public and private interest groups.

2. There is no top-level coordination of OCS management, practices, and studies initiated by the Department of the Interior. Line responsibilities for OCS activities are divided within the Department of the interior between two of its bureaus, both of which have a wide range of other activities that overshadow their OCS responsibility.

3. Clear lines of responsibility have not been established between the Department of the Interior and the Office of Coastal Zone Management despite the fact that offshore development in the Mid-Atlantic could produce the most important impacts on coastal zones since the Coastal Zone Management Act became law.

### DISCUSSION OF THE ISSUE\*

Despite the urgency which the Administration attaches to expanding offshore lease sales and petroleum production, no consolidation of responsibility and accountability for the OCS program in one agency has occurred.

\*This brief discussion of the issue is taken from the full text of "Development of Offshore Oil and Gas in the Mid-Atlantic," chapter IV, particularly pages 124- 140.

### Public Participation Comments

"We believe, however, that the confusion, delays and inefficiency involved has been a major factor in the program which I think has not been attempted to develop in the past. Over the years that we have had the same problems of not having enough staffed, and generally not having running operations and the program which is not centered.

"Coordination is not only within Interior, but also with other Federal agencies, State and local organizations.

"I feel that private industry can do a much better job than the Government. Get the Government out of business and stay out. Business in this country strong. Government has been too slow to get into inflation.



The Department of the Interior, in its OCS management role, must coordinate elements of offshore development that involve cabinet-level departments, some 15 subcabinet and independent agencies, 22 State governments, and public and private interest groups. Over the past 2 years, this coordination has been seriously questioned. Examples of this difficulty have been disputes over pipeline jurisdiction among agencies within the Interior Department itself. One Interior Department agency had been negotiating, without success, with a Transportation Department agency over pipeline jurisdiction for nearly 5 years before a memorandum of understanding was signed by the two Departments. No policy-level pressure has been brought to bear on Interior's Bureau of Land Management and the U.S. Geological Survey to solve their own jurisdictional problems about pipelines within the Interior Departmental

Many studies of offshore development have been initiated at middle and lower levels of the Department. It is not clear whether they will produce information that policy makers either at the Federal or State level actually require. There is no top-level coordination of such studies.

Line responsibility for OCS activities is divided within the Interior Department between two bureaus, both of which have a wide range of other activities that overshadow their OCS responsibilities in terms of manpower and budget. The Bureau of Land Management (BLM) is the lead agency in developing leasing programs and granting rights to offshore exploration and development. Once leases are signed, responsibility for supervising offshore activities passes to the U.S. Geological Survey (USGS), which is primarily a scientific agency with limited regulatory responsibility. The USGS drafts technical regulations for offshore equipment and operations and enforces those regulations. The regulations have been, and continue to be, more concerned with specific items of equipment than with relationships between the equipment and the total oil and gas development system.

Clear lines of responsibility have not been established between Interior officials and officials of the Office of Coastal Zone Management for OCS operations, despite the fact that offshore development in the Mid-Atlantic could produce the most important impacts on

"No bids or contracts or licenses should be issued by the Department of the Interior until standards established by the states are complied with."

—Senator Bayh

"The problem is that the Department of the Interior has no authority to solve the problem. Top management is either insensitive or has no interest. Offshore exploration is a pre-scientific activity."

"Total cooperative program between local, State, and Federal Government."

—Senator Bayh

"Even if the Federal Government should enter and operate any of the offshore drilling rigs, it is the responsibility of the Federal Government to make sure that the rig is safe and that the rig is not used by the Government without the permission of the State and Federal Government."

—Senator Bayh

coastal zones there of any single development since the Coastal Zone Management Act became law.<sup>2</sup>

The Office of Coastal Zone Management (OCZM) could have a significant impact on offshore energy development when States begin to complete coastal zone plans. The Office has had a relatively minor role in offshore energy development to date. This role could change when New Jersey and Delaware submit final plans and the Office must make judgments about whether the plans make sufficient allowance for coastal zone activities that are in the "national interest" and whether, in turn, Federal activities in coastal zones are "consistent" with State plans. Neither "national interest" nor "consistent" has been formally defined by the OCZM or any Federal agency so far.

State officials have expressed a hope that once coastal plans are completed, the Office of Coastal Zone Management would function as a clearinghouse for Federal activities and plans to help States sort out various Federal programs with coastal implications. They also said they would hope the Office would assert authority, once coastal plans are completed, to force coordination among Federal programs that involve coastlines. a

In addition, long-range national policy questions which arise from accelerated leasing schedules should be considered.

For example, can the United States proceed indefinitely without (a) a formal process for determining total energy needs and (b) calculating the share of those needs that should be provided by OCS resources? That allocation, rather than the existing program for leasing maximum acreage in the minimum number of years, could become the guide for future leasing programs. It is also important to consider whether the United States can proceed indefinitely with offshore developments for oil and natural gas and other seabed resources, fisheries, and commercial activities, without a formal process for reconciling conflicts not only among the uses but between those uses and their impact on the ocean environment.

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## CONGRESSIONAL OPTIONS

1. Assign a single policy-level office within the

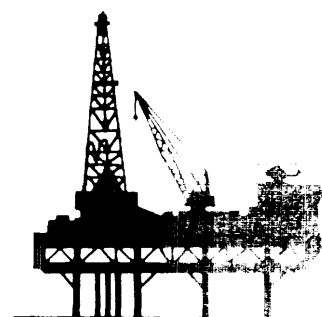
Department of the Interior the authority and responsibility for OCS policy coordination.

2. Assign to a single policy-level office within the Department of the Interior general responsibility for program coordination with all Federal agencies with OCS responsibilities and specific line authority and responsibility for operations of:

- those sections within the USGS which now draft and enforce technical regulations for offshore oil and natural gas activities;
- those sections within the Bureau of Land Management which now supervise offshore leasing and environmental studies programs; and
- all land uses, ocean use, economic, geological, and other planning that is now carried on independently in various sections within the interior Department that relate to OCS operations.

## Regulation and Enforcement

Inadequate regulation and enforcement of offshore oil and gas technology could result in more accidents and more oil spills than would occur if a more effective system were implemented.



Oil and Gas

### FINDINGS

1. The present Federal system for the regulation of offshore oil and gas development and for the enforcement of these regulations does not assure the use of adequate technology for safety and pollution prevention.

2. Many of the operating orders for the Mid-Atlantic are not issued by the Department of the Interior until after leases have already been sold.

3. Technology exists for setting design standards, installation practices, specifications, and scheduling tests and inspections for all major equipment items related to OCS operations but it has not been utilized.

### DISCUSSION OF THE ISSUE\*

Three principal aspects of regulating offshore oil and gas technology are in question:

1. The standards and specifications for design, construction, and installation of individual components.
2. Regulations which are issued to guide the operations and illustrate best technical practice for use of each component.
3. The enforcement system and procedures for checking, monitoring, and reporting adherence to established regulations.

A significant problem with identifying potential impacts from lapses in technology supervision is the fact

### Public Participation Comments

"...there is any kind of safety review, it will not get the attention it deserves unless there is independent review at preestablished 'milestones' in the life cycle. Whether this safety review is accomplished by a particular agency or a particular agency or two, it must have the necessary information and the independence to do so."

"But the technology is constantly changing, varied and complex, and it is difficult to apply existing regulations to new platforms. Regulations are not the only way to ensure safety. There have to be people who are responsible."

"We must not overregulate. The Nation develops."

— Mr. J. R. Smith

\*This brief discussion of the issue is taken from the full text of "Development of Offshore Oil and Gas in the Mid-Atlantic," chapter IV, particularly pages 140–171.

that very little data or analysis is available for evaluating accidents and safety questions.

During offshore U.S. oil operations spanning the 10 years from 1967 to 1976, major spills (of more than 1,000 barrels each) were few in number but caused more than 80 percent of the pollution by volume. The two principal sources of these spills were underwater pipelines and drilling-production platforms, each contributing roughly equivalent numbers and volumes of spills.

"Safety Alert" notices, which are issued in the Gulf of Mexico to warn industry of malfunctions in equipment, provide other data on causes. Of 27 such notices reviewed, the causes of significant accidents included platform machinery malfunctions, platform construction operations failures, ship collisions, blowout-preventor malfunctions, shallow gas pockets, and severe storms.<sup>1</sup> There appears to be no systematic analysis of this accident data or any other for the purpose of determining where specific improvements are needed.

The U.S. Geological Survey, principally through OCS orders and other lease stipulations, regulates OCS technology and related activities. Recent studies have made recommendations for several changes, including more stringent regulation of oil spill prevention equipment and techniques, better equipment standards, and increased inspection and training.<sup>2</sup>

Few of the substantive recommendations of these studies—which included development of comprehensive standards and specifications, improved training, and improved inspection and enforcement practices—have been reflected by changes in proposed OCS orders for the Mid-Atlantic or other regions such as Alaska. The USGS, in fact, debates the need to complete orders and inspection plans prior to a lease sale. The USGS has, on the other hand, instituted a number of the procedural recommendations of these studies.<sup>3</sup>

The USGS decided, in the case of the 'Mid-Atlantic, orders on platforms and pipelines would not be issued until some unspecified time after the lease sale and that inspection procedures would be established only after exploration and development activities take place. The USGS has said that there is no need to issue these orders until the industry clearly intends to develop an offshore area.

"Must provide absolute reliability check on equipment and operators of vital equipment. Operators must be very well selected for ability to accept responsibility and to perform consistently."

"We have the technology to undertake these projects with complete safety to our environment. . . make the oil company use it."

"It takes less capital dollars to rebuild than to construct, and frequent and rigorous inspections of facilities should be requested."

"It is necessary for exploration to be covered to a depth of 100 feet beneath the surface. Scientific data developed at Wood's Hole Oceanographic Institution. . . . Massachusetts stated that only at the bottom of the Gulf the bottom is not affected by storms and will not drift to form trenches. These pipes pose a serious threat to reefs and to a large seabird and seabird populations. In addition, when we sink a pipe, it is a threat to the seabirds."

The offshore oil industry has developed a good safety record with regard to oil spill accidents from platforms, especially since the Santa Barbara spill in 1969. At the same time, however, Federal regulatory agencies, principally USGS, do not appear to employ the best available system for establishing standards and enforcing regulations. There is, therefore, no assurance that the best practices and standards will be consistently followed.

Pipeline networks have not been subject to stringent regulatory standards in the United States in the past and pipeline failures, with resulting oil discharges, have occurred in the Gulf of Mexico as well as in other offshore development regions.<sup>4</sup>

Specific design standards, installation practice specifications, and scheduled tests and inspections could readily be adopted for pipelines in the Mid-Atlantic region, and in other OCS regions, based on existing knowledge and available technology.

New technology is available to assure pipeline safety and could be immediately incorporated in regulations prior to any lease sale. This includes standards for coating pipelines with corrosion protective materials, standards for welding and inspecting welds, specifications for pipe materials, and procedures for installing and burying pipe.

Oil production platforms are highly complex systems, subject to great uncertainties, which are designed, built, and installed by oil companies under stringent self-imposed technical guidelines. There is very little regulation of this technology. Most recognized industry standards are not required by Government regulations; the OCS order for platforms merely states that platforms shall be adequately designed and certified, Government inspections of construction, installation, and operations are not systematically planned.

The American Bureau of Shipping, a private group which sets design standards and inspects offshore equipment for insurance companies, has developed specifications and inspection procedures for offshore mobile platforms. The Bureau regularly works with the U.S. Coast Guard to certify ships and other floating equipment. Adoption of this regulation and enforcement practice to fixed production platforms by OCS regulatory agencies could increase the effectiveness of the present system immediately.

"On the OCS, and supervision far and away the of preventing sp

"We seriously q capability of ag [National Ocean Administration] Guard] to handle recommended

"An across th subsea comp practical and

"... the implementation of the methods and procedures the regulation of OCS operations the USGS. We do not a Federal agency

"If these sources of energy developed while keeping leaks and breakage of oil hurricanes under control of great benefit"

The U.S. Coast Guard recently developed regulations for deepwater ports which, in many cases, cover technology and hardware similar or identical to that used in OCS operations. The Coast Guard philosophy of regulation appears to be one of setting detailed, firm and comprehensive rules for designing, building, and operating, and then carefully checking adherence to those rules. On the other hand, the USGS philosophy appears to be one of asking for industry's best efforts and then making broad judgments about its adequacy.

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### CONGRESSIONAL OPTIONS

The following options are available for making changes to the present system:

1. Require that OCS orders be completed prior to, and made part of, all lease sales. Such orders should include design standards for the complete system, along with test and inspection schedules. Require development plans to be complete and comprehensive, to utilize environmental data developed for the region, and to follow specified standards and practices for the system.
2. Transfer regulatory and enforcement authority from USGS to the U.S. Coast Guard for major OCS systems, and apply existing Coast Guard regulations on drill ships and floating platforms to other offshore technology.
3. Separate regulation and enforcement for daily OCS operations within the Federal Government by assigning these responsibilities to an agency, or department, other than Interior, while preserving Interior's OCS development responsibilities.

# Oil Spill Liability and Compensation

Existing laws are not adequate either to assign liability or to compensate individuals or institutions for damages from oil spills resulting from exploration, development, or production in the Baltimore Canyon Trough area.



Oil and Gas

## FINDINGS

1. Because existing law does not deal comprehensively with liability for oil spills from offshore structures in OCS activity, the law of the adjacent State is used for determining a lessee's liability for damages. The laws of Delaware and New Jersey, which are adjacent to Baltimore Canyon lease areas, do not contain explicit provisions to provide for compensation to parties injured by oil spills.

2. Under existing statutory and case law, damaged parties lack effective protection against economic losses that may result when an oil spill reaches shore.

3. There are benefits to having the States handle some aspects of liability and compensation and these benefits can be preserved by a Federal law which does not completely preempt State laws.

## DISCUSSION OF THE ISSUE\*

The possibility of a major oil spill during development in the Baltimore Canyon Trough is a potential impact that concerns the public and government officials of New Jersey and Delaware. ] The concern is intensified by the fact that, under existing law, damaged parties lack protection against economic losses that may result from oil reaching shore.

The OTA oil spill risk assessment indicates that there probably would be at least one major oil spill during development of the Baltimore Canyon Trough. Under certain weather conditions and at certain times of the

## Public Participation Comments

"...unlimited liability must provide a strong incentive for not undertaking activities which might result in a spill charge."

"Has any assessment been made of the effect of unlimited liability on the willingness of oil companies and/or contractors to voluntarily accept responsibility to assume such risks?"

"Funds should be set up to pay for damage caused by the most dangerous leaks. Companies responsible for such leaks must be required to contribute."

\*This brief discussion of the issue is taken from the full text "Development of Offshore Oil and Gas in the Mid-Atlantic," chapter IV, particularly pages 165-167.



year, oil could come ashore anywhere in the New Jersey area, affecting tourist and commercial fishing incomes. Natural resources such as estuarine areas and wildlife preserves whose values are difficult to quantify economically also could be damaged.

Most Federal liability statutes apply to spills from vessels rather than spills that may occur as a result of offshore oil and gas development. Under existing law, offshore structures such as production platforms probably would be treated as artificial islands and would not be governed by the principles of law governing the liability of vessels.<sup>3</sup>

Offshore structures within the territorial seas are covered in the Federal Water Pollution Control Act (FWPCA), as amended (33 USC 1321), which makes a discharger liable to the Federal Government for cleanup and removal costs up to a limit of \$8 million. The discharger is liable for full costs if negligence can be shown. However, no evidence of financial responsibility such as a surety bond is required for offshore operators. A \$35 million fund is established to support cleanup efforts when a discharger fails to act on his own but there is no provision for compensating parties for damages that the cleanup effort cannot prevent. Such parties must rely on the courts and the application of the common law of torts to recover losses under theories of negligence, trespass and, occasionally, nuisance. Primary responsibility for administering the liability provisions of the FWPCA rests with the U.S. Coast Guard which monitors all cleanup efforts and, when necessary, initiates Government cleanup.

Other relevant Federal statutes which deal with liability for oil pollution are the Deepwater Port Act of 1974, the Trans-Alaska Pipeline Authorization Act of 1973, and the Outer Continental Shelf Lands Act of 1953. Each of these has specific and limited application.

The Outer Continental Shelf Lands Act does not specifically establish a system for oil spill liability, although it does authorize the Secretary of the Interior to promulgate regulations to prevent waste and conserve natural resources. When read in conjunction with other related laws, such as the National Environmental Policy Act, that provision authorizes the Secretary to issue rules pertaining to pollution which are binding on the lessees.<sup>4</sup>

"I was once producing oil rigs along the coast. An oil spill would bankrupt me. You must provide for more rigorous protection than you now have and financial relief in case of a spill."

—FISHING BOAT CAPTAIN

"The general philosophy behind ideas such as this is to attempt and sort of 'balance' out the situation. There is the same legislation and regulation to make sure primarily to show that the Government is absolutely sure for everyone except the oil companies."

—OIL COMPANY OFFICIAL

"Some damages to the ecosystem may be irreversible and not subject to reclamation through any amount of compensation. Prevention is better than reclamation."

—FEDERAL GOVERNMENT OFFICIAL

After the Santa Barbara oil spill, regulations were issued (34 FR 13547, August 22, 1969) making lessees strictly liable for all cleanup and removal costs. However, the regulations stipulated that a lessee's obligations to third parties, other than those of cleanup costs, are governed by applicable law (30 CFR 250.43).

In the absence of Federal law dealing with liability for oil spills resulting from offshore development, the applicable law for determining a lessee's liability for damages presumably is the law of the adjacent State.<sup>5</sup> Both New Jersey and Delaware are working on new liability laws,<sup>6</sup> but present laws do not seem to provide for compensation to injured parties, other than through civil action.

The objectives of a model oil spill liability law include an incentive to prevent spills and to move quickly to contain and clean up those spills that cannot be prevented; compensation for damage victims, and assurance that a lessee would be able to assume any financial burdens resulting from damage claims.

Current laws do not meet those objectives. While rapid cleanup may be somewhat encouraged by the present system, the incentive to prevent oil spills is not as strong as it could be. Although an OCS discharger is strictly liable, and there are few defenses against damage claims, liability is limited to removal and cleanup costs except where courts apply common law to require compensation.

Other questions have to do with whether loss of opportunity for recreation or loss of navigation rights are properly recoverable injuries.

Under current laws, if a lessee escapes liability under one of the permissible defenses, and cleanup costs exceed the current \$35 million fund limit under the FWPCA, there is no source of funds from which to compensate loss. This problem could be addressed in new legislation,

Because offshore operators are not required to demonstrate financial responsibility and because insurance against oil spills sometimes is difficult to obtain, it is possible that companies which could not assume current required liability expenses would be permitted to operate off New Jersey and Delaware. B

Finally, there are ties — people talk of Atlantic City and the fact is that OCS is the biggest stakes of...

"There is presently, except the aspect of liability event of spillage, to ensure superior planning or use the best available technology to prevent spillage."

Full liability insurance for ocean-related pollution has been generally unavailable on the commercial market to owners and operators of onshore and offshore facilities.<sup>9</sup> This is partly because insurers cannot accurately estimate potential damage or loss. The oil industry has established an entity to compensate victims of pollution by onshore and offshore oil structures. Oil Insurance Limited (OIL) is an insurance company set up by members of the industry to cover catastrophes, property damage, pollution, and wild-well control, both onshore and offshore. Coverage up to \$100 million per member company, with a deductible of \$1 million, will be provided in any one year. A company must repay OIL over a period of 10 years for all settlements through retroactive premiums.

While compensation for direct physical damages could be awarded by the courts, such an award would depend on the ability of a damaged party to underwrite protracted legal action. Indirect damages are even less likely to be recoverable.<sup>10</sup> Therefore, there are many potential circumstances where an injured party would not be able to obtain adequate compensation.

Property owners who are directly damaged by oil would have the best chance to recover property and business losses under existing law. However, courts generally have held that lost business profits and lowered property values of persons whose property has not been directly damaged by oil could not be foreseen by a negligent party and therefore are not grounds for damage claims. Thus, there is no recourse for such people as hotel owners whose property is not on beach frontage and therefore cannot be damaged directly, but who lose income because an oil spill keeps tourists away from a resort area. Other principles such as trespass and nuisance are even more limited in application and also provide no recourse for those who are indirectly damaged.<sup>11</sup>

Existing laws are not clear on the unresolved question of whether State or local governments may seek and obtain relief for loss of wildlife or natural beauty or other damage to the environment. Nor are the laws clear on whether governments may claim damages for lost tax and licensing revenue for diminished tourism and reduced harvesting of fish.<sup>12</sup>

Perhaps the most controversial subject of any

liability and compensation discussion is unlimited liability for all cleanup costs and damages.

There is disagreement on whether an unlimited liability provision would encourage industry to undertake the least pollution-prone operation or would discourage industry from undertaking operations with any risk at all. There is also disagreement over whether unlimited liability would encourage those responsible for spills to rapidly and completely clean up a spill or whether it would encourage laxity.

Some suggest that unlimited liability is either uninsurable, or that the rates for such insurance will be prohibitive to independent companies. However, unlimited liability already exists in such areas as crew claims and cargo damage in shipping, although potential losses in these areas are easier to calculate than are oil spill losses. Some instances of unlimited liability have been in effect for several years without any adverse effect. At the Federal level, the OCS regulation imposing unlimited liability for cleanup which followed the Santa Barbara accident has been in effect since 1969 and the participation of independents has not been endangered. At the State level, four States have unlimited liability laws, and have not noticed adverse impacts on the oil industry.<sup>13</sup>

Both Delaware and New Jersey are considering their own liability and compensation legislation, but because preemption of State laws is a key provision of some proposed Federal legislation, the States may be reluctant to invest considerable effort in adopting such legislation which could be nullified by Federal law.

However, in two important areas of liability plans—rapid, reasonable cleanup and equitable damage compensation—States appear to be better qualified to deal with the situation than the Federal Government. For example, experience has shown that State agencies respond faster to spills than Federal agencies.<sup>14</sup> A In addition, State officials may be better able to evaluate local damages and a fund administered on the State level may be more accessible to claimants.

The benefits of both State- and Federal-level regulation of oil spill liability and compensation could be preserved in a framework that would: (1) require States to accept Federal certificates of financial responsibility,

thus minimizing compliance costs to industry; (2) prevent States from levying fees on oil for the purpose of creating State funds, thus minimizing product costs to consumers; and (3) permit States to impose their own liability limits and to create funds by appropriations in order to undertake cleanup operations and compensate damage victims.

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### **CONGRESSIONAL OPTIONS**

1. Congress could adopt legislation dealing with liability and compensation for damages associated with offshore oil and gas production that would be comprehensive enough to cover such problems as indirect damages, class actions, and unlimited liability.

2. Congress could adopt liability and compensation legislation that addresses only direct damages and let other issues evolve through case law.

## Oil and Gas

## Public Participation Comments

- The current state of the USGS of our plans, ... are self-effective pollution is no need to ... tions, eq ... levels of ... for covering

The greatest danger is the danger of scientific invention recurring as a serious threat.

"Let's get it. Nobody can guarantee that there will never be a new industry record in the future. The potential benefit ratio for offshore development is 100 to 1."

*Journal of Management Education* 36(8)

\*This brief discussion of the issue is taken from the full text of "Development of Offshore Oil and Gas in the Mid-Atlantic," chapter IV particularly pages 165-167.

The Coast Guard is responsible for the implementation of Federal pollution response functions in the coastal area as required by the National Contingency Plan. A memorandum of understanding between the Coast Guard and the Department of the Interior gives the Coast Guard the responsibility to respond to discharges in the OCS consistent with this plan, but reserves for the Department of the Interior the responsibility of controlling the discharge at the source.

The Coast Guard, in implementing the intent of the FWPCA, has structured its enforcement and response posture to foster the cleanup of polluting discharges by the responsible party. The Coast Guard on-scene coordinator, in each pollution incident, makes a determination as to the propriety of the responsible party's removal actions and initiates Federal removal actions when they are necessary.

The confusion over who is in charge should a spill occur has been evidenced by OTA'S inquiries of public and private groups in the New Jersey and Delaware region. Most local officials are unaware of the provisions of the National Contingency Plan or the Coast Guard-Department of the Interior memorandum of understanding and do not know what action would occur or who is available to take actions in the event of an oil discharge.

The key to oil spill cleanup operations is quick response. The 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. The Coast Guard has developed high seas containment booms and removal devices and has begun stockpiling this equipment. Towable high-speed delivery sleds have been developed by the Coast Guard and are to be available prior to development of the Mid-Atlantic OCS.

Industry, through Clean Atlantic Associates, Inc., is developing a stockpile of equipment and operational procedures for dealing with potential oil spills, but there are no firm Government requirements for most of their activities.

The Department of the Interior, under the authority of its OCS operating orders, which require lessees to maintain cleanup equipment, could monitor Clean Atlantic Associates activities, but cannot order the group

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to acquire equipment meeting certain standards or to train personnel for certain levels of operation.

### **CONGRESSIONAL OPTIONS**

1. Provide authority and funding for the Coast Guard to patrol for oil spills and take charge immediately should a spill occur.

2. Prepare definitive regulations for industry to follow, including standards for equipment, minimum levels of manpower readiness, and responsibility for coverage on all OCS oil spills.

### **OTHER OPTIONS**

Federal and State officials could develop a strong information program to advise local officials and the public of procedures that would be followed and parties who are responsible for actions in the event of a spill.



## **Environmental Studies**

Environmental research and baseline studies are not formally coordinated with the Interior Department's leasing schedule and there is no requirement that information gathered be used in the decisionmaking process for sale of offshore lands and subsequent operation.

### **FINDINGS**

1. The purpose of Interior's environmental studies program and its role in the management of OCS development has not been clearly defined.

2. The value of the investment in environmental studies is questionable if there is little or no relationship between the studies and management decisions.

3. Environmental studies to date are not useful either for Environmental Impact Statements or in leasing decisions because they are not completed in time to be used.

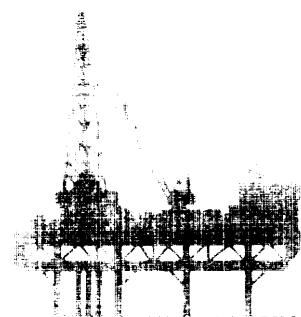
4. Some important elements are missing from the Mid-Atlantic and other regional studies now underway, including nearshore investigations, climatology, physical oceanography, and shallow geologic studies.

### **DISCUSSION OF THE ISSUE\***

The OCS environmental studies programs now underway in frontier areas are a major Federal undertaking in oceanographic investigation. The fiscal year 1976 budget for these studies is over \$40 million with substantial field data collection underway in the Mid-Atlantic, Gulf of Mexico, offshore Southern California, and Alaska. Most of the programs include collection of marine biological data, measurements of hydrocarbons and trace elements in the marine environment, and analyses of physical and chemical characteristics of the marine environment. Some of the programs also include other specific biological, oceanographic, geologic, and meteorologic studies.<sup>1</sup>

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\*This brief discussion of the issue is taken from the full text "Development of Offshore Oil and Gas in the Mid-Atlantic," chapter IV, particularly pages 131-140.



Oil and Gas

## **Public Participation Comments**

The purpose of these studies has not been fully defined, and many questions remain about how the information developed can or will be used in the decision-making process of leasing OCS lands and managing or regulating subsequent OCS activities. Presumably, the environmental studies will begin to establish a definition of the "baseline" or existing environmental conditions from which one can measure environmental impacts that might be caused by any oil and gas activities throughout the life of an offshore field. The studies would also continue in conjunction with oil development and become closely related to monitoring of any environmental changes. In addition, many biologists believe that the studies should identify environmentally sensitive areas or special hazards that would indicate which areas, if any, should be withdrawn from lease offerings.<sup>2</sup>

The vague relationship between these studies and any decisionmaking process, however, is a principal issue. If there is little or no relationship between the studies and management decisions, then the value of the investment in the studies is questionable. If the studies do not include environmentally sensitive regions such as nearshore waters or do not provide adequate scientific evidence, then the usefulness of the results is questionable.

Many scientists claim that the studies are not well planned since they attempt to solve too many complex problems within unrealistic time frames, and that study efforts are hopelessly fragmented. s A priority of important subjects should be established if meaningful results are to be obtained. Some important elements are missing from the Mid-Atlantic and other regional studies now underway, including nearshore investigations, climatology, physical oceanography, and shallow geologic studies.

## CONGRESSIONAL OPTIONS

The following options could be employed for making such changes in the present system as may be needed:

1. Require that environmental studies be made a formal part of the lease-management process by

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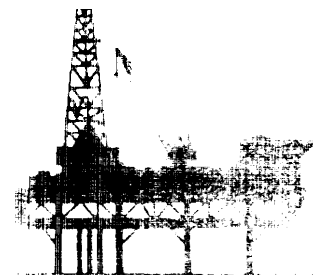
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defining the content and timing necessary for providing data for milestone decisions.

2. Require that environmental studies that would define baselines and identify sensitive or hazardous areas and conditions be completed prior to preparation of a development plan, and that the data be used in evaluating and approving development activities.
3. Separate the responsibility for environmental studies from the agency in charge of development (Interior) and put a scientific agency in charge (such as the National Oceanic and Atmospheric Administration).

## State Role

The limited role of State governments in the decision-making process for OCS development under existing laws and practices may lead to unnecessary delays and improper planning for such development.



Oil and Gas

### FINDINGS

1. New Jersey and Delaware officials are not receiving information which they consider necessary to plan for dealing with the onshore impacts of offshore development and there is no description in present laws or regulations which specifies what information must be provided to the State in development plans or impact statements.

2. Top-level State officials in New Jersey and Delaware do not believe that current laws and practices for planning and administering offshore petroleum development allow for full State participation in important decisions.

3. Without meaningful State participation in decisionmaking, State and local officials may try to use **court action** to block or delay decisions with which they disagree.

### DISCUSSION OF THE ISSUE\*

The flow of information from the Federal Government to the States in the 2 years since the decision was made to accelerate offshore leasing has been slow and uncoordinated. The States are concerned about this situation because they need comprehensive and timely information in order to plan for the onshore effects of offshore development.

Offshore energy development eventually will mean the location of staging areas, pipelines, tank farms, gas processing plants, and perhaps even new refineries on

### Public Participation Comments

"Coastal zone and offshore lands are governed by different community."

"I believe New Jersey is to blame for this. The state is not doing enough to protect the coastal zone and offshore lands."

"States are not doing enough to protect the coastal zone and offshore lands. They are not receiving grants and tax-breaks."

"There is a problem with the way the states are handling this. There is a need for more information and more participation from the states. There is a need for more information and more participation from the states."

\*This brief discussion of the issue is taken from the full text of "Development of Offshore Oil and Gas in the Mid-Atlantic," chapter IV, particularly pages 136- 140, 146- 150.

shore to support OCS oil and gas production. The States are concerned that these onshore activities may require major investments of public funds that cannot be scheduled without considerable advance warning and some assurance that the investments actually are required, and that revenues ultimately generated by offshore activity will support the expenditures.

State officials say, by and large, that they understand the present limitations on the Interior Department in providing some types of data. They also recognize that some progress has been made in meeting State needs, but most of the steps taken by the Bureau of Land Management (BLM) to provide information are strictly administrative actions, are not guaranteed by law, and can be changed without consultation with the States.

State officials also say that there are still specific information gaps, principally in the following areas:

- Hard information on potential onshore impacts, including a quantification of potential economic losses to tourist and fishing industries.
- Detailed estimates of oil and gas reserves.
- Historic and predictive data on the incidence and effects of oil spills.
- Information on geologic and climatic conditions and shoreline characteristics that might pose dangers to offshore structures and pipelines.
- Environmental and baseline data in general, particularly data on wetlands and nearshore areas.

Once management plans have been approved by Federal officials under the Coastal Zone Management Act, both States presumably would have a legal right under the Act to "necessary information and data" about any Federal activity in their coastal zone, including activity related to offshore oil and natural gas development. However, since the Act does not specify whether the States or the Federal Government would interpret the word "necessary," it is not certain that it will solve the States' information problems. Final approval of New Jersey and Delaware coastal zone management programs is expected early in 1977.

The Federal Department of the Interior, New Jersey, should have initiated a series of public proceedings. The Federal agency know best, and the domestic experts simply are not needed in the area of offshore oil and gas.

It feels as if it is out of the way and out of the way.

The new project is the first of the Nation's first. But as the States of New Jersey individually, the States of New Jersey have to be able to get the information and data that they need to make effective decisions on the project.

States have also pressed for access to point-of-no-return decisions that would affect the location and magnitude of onshore activities. By law, the States' role is presently limited to not much more than that of an observer. They are allowed to comment on information and proposed actions, but there is no requirement that their comments and suggestions be acted upon.

The goal of legislation should be to create a framework for relationships between State and Federal Governments that would ensure States full participation in major OCS decisions. One way to assure State involvement in those major decisions could be to make participation a legal right of a State rather than an option of Federal decisionmakers. Thus, the right of States to a voice in policy decisions that may have significant social, economic, or environmental consequences for their citizens, would be unobstructed up to, but not including, the right to veto Federal offshore development plans.

States have the right through their riparian laws, environmental protection regulations, and zoning powers to block or delay development once it involves State lands. State officials with whom OTA researchers talked in the course of the study seemed universally to prefer continuing participation in development decisions rather than blocking actions, but officials indicate they will take legal action to block development if their concerns are not satisfied.

Under pending legislation, a revision of the OCS Lands Act of 1953, States would be entitled to comment on development plans before they were approved by the Secretary of the Interior, to have written explanations for the Secretary's rejection of those comments, and to appeal that decision to the U.S. Circuit Court of Appeals.<sup>1</sup>

That same principle of arbitration could be applied to other important decision points in the development process, including the sale of leases. The Interior Department, for example, could solicit State comments on proposed lease sales and solicit State proposals for lease stipulations which States felt necessary to protect their environmental and economic interests. Interior could explain in writing why any State proposal had been rejected. States could have the same rights of appeal on lease stipulations as they would have on development plans under the pending legislation.

"Exploration should be a State and Federal Government partnership"

"It is probably better to get the State and Federal Governments working together on the Interior Department's plan to contact with the State and Federal Governments with readily available information. This situation is much more complex than it appears."

"It would be a good idea to have a draft report that a draft affected State draft would, and a final report"

Enforcing agencies could also submit to the States long-range and detailed plans for enforcing lessee compliance with operating orders, evaluate State comments on the plans and either modify them or explain a failure to modify them to accommodate any State objections.

Such free exchange of information and State access to decisions would not necessarily resolve all future conflicts about offshore energy development. It would, however, help clear up uncertainties about the ground rules for development which affect not only Federal and State officials but the oil industry as well.

Codifying the rights of States to participate in decisions, object to proposals, and appeal to third parties could extend the time required to set offshore energy development in motion in frontier OCS areas. However, the existing process has its own built-in potential delays through court actions and challenges to locations of onshore facilities.

Codifying the rights of States would, at least, make it possible to anticipate delays and to know with some degree of certainty how much more time the process would take than it does under existing law.

"One cannot fault the USGS if they are adhering to the letter of the law with respect to divulgence of information or State involvement in offshore energy development decisions, but that does not mean that legislation could not be enacted to remedy the situation."

The Department of the Interior is not bound to an ironclad schedule and slippages do occur [in the OCS sale dates]. If State members of the Advisory Board ask the Office of OCS Planning for Coordination, they will be told, "I don't know if it's feasible, but we'll try to get it done."

## CONGRESSIONAL OPTIONS

1. Congress could require the Department of the Interior to solicit State comments on proposed lease sales, State proposals for stipulations to be written into leases, and State comments on development plans to protect economic and environmental interests. The Department of the Interior could be required to explain in writing why any State proposal was rejected and States could have a right of appeal.

2. Congress could require enforcing agencies to submit to the States long-range and detailed plans for enforcing lessee compliance with operating orders, evaluate State comments on the plans, and modify the plans, or explain a failure to modify them, to accommodate State objections.

3. Congress could require that an impact statement be prepared to accompany each development plan and that major development plans include detailed descriptive, design, and procedural information on offshore and onshore facilities that industry wants to build.

# Pollution Research

The effects of pollutants which maybe discharged during OCS operations cannot presently be determined with any accuracy and recent research efforts have not clarified conflicting claims by oil companies and environmental groups regarding the amount and consequences of marine pollution.

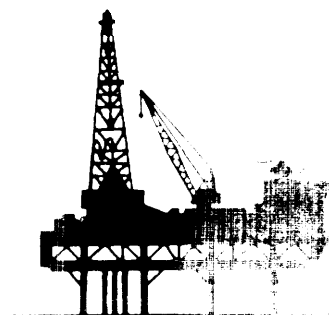
## FINDINGS

1. Many specific environmental conditions of each OCS region which may affect the dispersion, trajectory, chemical composition, and ultimate fate of a spill are unknown.
2. It appears that very little public research money is allocated to projects that address the unknowns of the effects of oil spills and other OCS pollutants.

## DISCUSSION OF THE ISSUE\*

Some unavoidable oil spills from accidents, chronic oil discharges from platforms, and discharges of other pollutants will occur should the Baltimore Canyon Trough be developed. It appears that future estimates of pollutant discharges from OCS operations can be based on statistical evidence from past Gulf of Mexico experience because no major changes in levels of pollution control technology are projected. Since it probably would require substantial investments to effect major reductions in pollution levels, the questions of benefit received are constantly raised. There are no reliable estimates of total environmental damages that may be caused by OCS related pollution, and it is very doubtful whether marine biological, esthetic or chemical changes caused by pollution can now be quantified.

What is not known and cannot be measured at this time is the severity of damage related to amounts and concentrations, the effects on the food chain and ultimate consumer, and the long-term effects of chronic discharges. Also unknown are many specific environmental



Oil and Gas

## Public Participation Comments

It is gravely important that the public and political leaders look at the possible dangers of their actions in the oil and employment fields to help a poisoned environment.

Problems of environmental damage and industrial pollution require careful study. The public must be given good planning and information to make a decision on whether to develop the area.

Merely authorizing a reporting system is not enough. The system must be based on PIRS [the Pollution Incident Reporting System] because the reporting requirements are not established by section 304 of the Federal Water Pollution Control Act, which is a system based on voluntary reporting.

The system must be based on the best available data and information.

\*This brief discussion of the issue is drawn from the full text of "Development of Offshore Oil and Gas in the Mid-Atlantic," chapter IV, particularly pages 134-135, 165-167.



conditions of each OCS region which may affect the dispersion, trajectory, chemical composition, and ultimate fate of any spill. Environmentalists argue that with so many unknowns, coupled with potential dangers, all efforts should be directed toward preventing oil spills whenever technically possible.<sup>1</sup>

The U.S. Coast Guard has recently evaluated its Marine Environmental Protection (MEP) program, which principally addresses oil pollution other than that related to OCS operations, but which can serve as an example of analyses of relative causes and effects of spills.

The Coast Guard oil spill data, however, includes only those OCS spills that are voluntarily reported. In this evaluation it is stated that oil exploration/production operations contributed almost a million gallons out of the 15 million gallon total discharged during 1974.

It is also stated that "the documented direct cost to society of oil pollution incidents (from all sources) in the United States is about \$50 million a year or in excess of \$4,500 per incident. The estimate is undoubtedly low since it includes only the costs of cleanup and the value of the product discharged." A far greater concern than direct cost is the indirect cost to society.

The U.S. Geological Survey maintains an oil spill data base in the OCS Events Files. In this file, information is maintained on all oil spills of one barrel or more, blowouts, fires and explosions, fatalities, and miscellaneous accidents. Input for each incident includes probable cause, type of operation, date, location, and brief description of the event. The file is updated monthly and the data are analyzed by USGS for amounts and trends. It is unclear, however, what use USGS makes of the analyses since many types of incidents occur repeatedly with no change in operating orders. Under present laws and regulations, oil spills from exploration or production facilities within 3 miles of shore must be reported to the Coast Guard. Oil spills from facilities beyond 3 miles must be reported to the USGS. There is no coordination of the information gathered by the two agencies.

The oil industry has sponsored a significant amount of research into the effects of oil pollution, including a study of the effects of oil operations on the marine environment off the Louisiana coast by the Gulf Univer-

ersity of Houston. The study, which was completed in 1974, found that the oil industry's contribution to the pollution of the Gulf of Mexico was negligible.

The OCS Events File provides a database of spill data. Authorization of a new central data collection and analysis mechanism would be helpful in this effort.

The weather is the cause of the majority of the largest oil spills.

Weather has been a difficult factor in the oil spill industry and has caused many problems. The impact of oil spill systems, such as the oil spill and the oil spill, is a major concern.

sities Research Consortium. z In addition, the American Petroleum Institute, the Coast Guard, and the Environmental Protection Agency sponsor regular conferences on prevention and control of oil pollution at which many reports on research efforts are presented.<sup>3</sup> There appears to be no equivalent coordination of pollution research efforts among Federal agencies which share responsibility for OCS management.

The report to Congress of the Secretary of Commerce on Ocean Pollution is one of the few examples of a coordinating effort. 'The report describes oil pollution research efforts by the National Science Foundation, the Environmental Protection Agency, the Bureau of Land Management, the Fish and Wildlife Service, the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, and others.

It appears that very little research money is allocated to projects that address the unknowns of the effects of oil spills and other OCS pollutants.

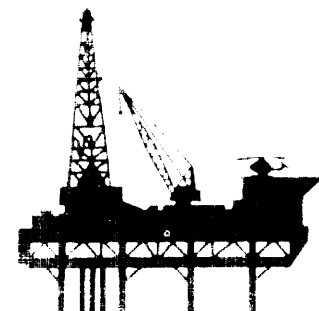
## **CONGRESSIONAL OPTIONS**

1. Sponsor additional research on the effects of pollutants at existing centers of excellence and specifically coordinate research pertinent to OCS operations through a central agency such as EPA.

2. Coordinate the collection of data about oil spills from exploration and production facilities by giving the USGS authority to require reports for all such spills, regardless of whether they are in State or Federal waters.

# Conflicting Ocean Uses

There are potential conflicts between OCS oil and gas activities and vessel traffic engaged in commercial shipping and fishing activities. However, there has been no comprehensive study and analysis to identify all conflicts and to find ways of resolving them.



Oil and Gas

## FINDINGS

1. It appears that proposed drilling rigs in the Baltimore Canyon Trough would be more vulnerable to ramming by ships than has been the case in the Gulf of Mexico.

2. Major traffic lanes for the ports of New York and Philadelphia lead through or near the lease area.

3. The Maritime Administration has stated that new traffic control systems have adverse economic impacts on shipping.

4. The Department of the Interior has already removed some tracts from leasing because of conflicts with fishing activities, but the presence of offshore structures could attract marine life, thus enhancing fishing and increasing watercraft traffic.

## DISCUSSION OF THE ISSUE\*

Rammings of oil and gas platforms by merchant ships have occurred in the Gulf of Mexico. In a recent incident, the Globtik Sun, a 50,000-ton Bahamian-registered tanker, struck a Chevron platform in the Gulf on August 15, 1975, resulting in the death of six persons, a major fire aboard the ship and a 5-mile long oil slick. The platform was not operational, so no oil was lost from it.<sup>1</sup>

While the number of Gulf of Mexico rigs which have been hit by ships over the past 10 years has led to only 1 percent of all oil spills, the great majority of these rigs are

## Public Participation Comments

"The offshore oil and gas industry is a major source of revenue for the Federal Government. It is also a major source of employment. The industry is a major source of pollution. The industry is a major source of conflict with other users of the ocean. The industry is a major source of conflict with other users of the ocean."

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\*This brief discussion of the issue is taken from the full text of "Development of Offshore Oil and Gas in the Mid-Atlantic," chapter IV, particularly pages 136- 140, 144- 159,

in quite shallow water, close to shore, and shipping lanes had been established to avoid them. Drilling rigs in the Gulf of Mexico are concentrated in areas where large ships do not normally travel, except at well-marked entrances to harbors. Only 10 major accidents involving ships striking drill rigs have occurred over the past 12 years. All but one (the most recent one) of the ships were under 20,000 tons. All were traveling closer to the coastline than was usual. By contrast, the Mid-Atlantic tracts proposed for sale are in deepwater commonly utilized by very large ships, but there is no proposal for traffic control. The EIS states that the Army Corps of Engineers issues navigation permits for locating rigs and platforms and "generally does not allow structures to be placed within traffic lanes as identified by the Coast Guard."<sup>2</sup>

Off the coast of New Jersey and Delaware, both coastal and trans-Atlantic traffic lanes from the major ports of New York and Philadelphia lead through or near the lease areas. Major vessel arrivals at the Delaware Bay have been estimated at about 5,000 per year by the Philadelphia Maritime Exchange. Major vessel arrivals at New York Harbor have been estimated at 8,400 per year. These two ports handle more than one-third of all U.S. imported and domestic oil transported by tanker. International agreements have provided voluntary vessel traffic separation schemes, which are established lanes for arriving and departing ships at the major harbors of New York and Delaware Bay. These lanes, however, do not extend as far out to sea as the proposed lease areas, except for one New York lane extending to the Hudson Canyon near the northern region of interest.<sup>3</sup>

One way to reduce the potential hazard is by reducing the number of structures on the surface of the water. This can be done, and is done to some extent in the Gulf of Mexico, by the use of subsea completions which locate the valves and wellhead controls far underwater on the sea floor rather than on production platforms.

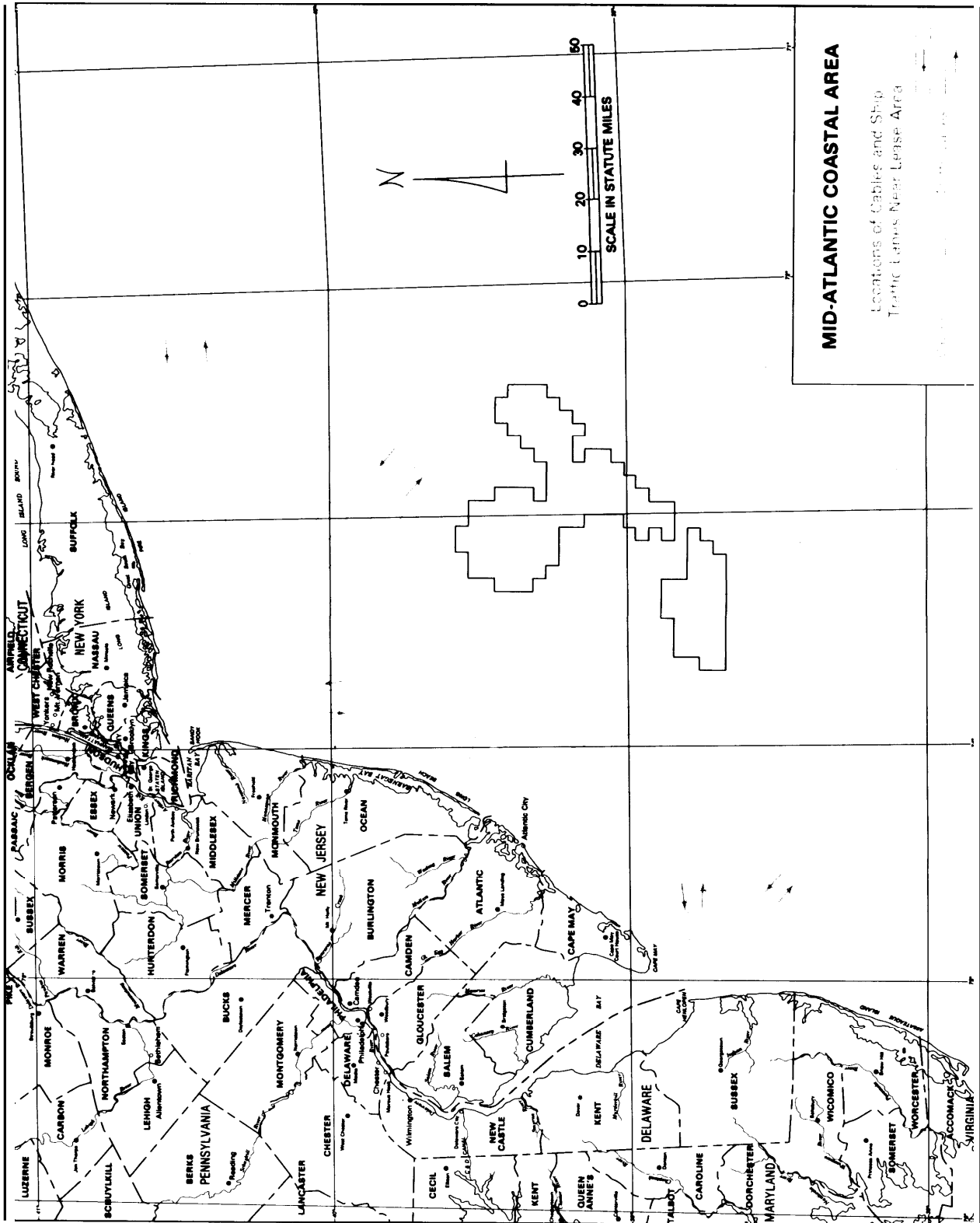
It appears that in general, any proposed structure on the surface of the Mid-Atlantic Ocean would be more vulnerable to ramming by ships than has been the case in the Gulf for the following reasons:

1. The large ship traffic density in the vicinity of potential rigs in the Mid-Atlantic is probably two to three times that of the OCS region of Louisiana.

Off the coast of New Jersey and Delaware, both coastal and trans-Atlantic traffic lanes from the major ports of New York and Philadelphia lead through or near the lease areas. Major vessel arrivals at the Delaware Bay have been estimated at about 5,000 per year by the Philadelphia Maritime Exchange. Major vessel arrivals at New York Harbor have been estimated at 8,400 per year. These two ports handle more than one-third of all U.S. imported and domestic oil transported by tanker. International agreements have provided voluntary vessel traffic separation schemes, which are established lanes for arriving and departing ships at the major harbors of New York and Delaware Bay. These lanes, however, do not extend as far out to sea as the proposed lease areas, except for one New York lane extending to the Hudson Canyon near the northern region of interest.<sup>3</sup>

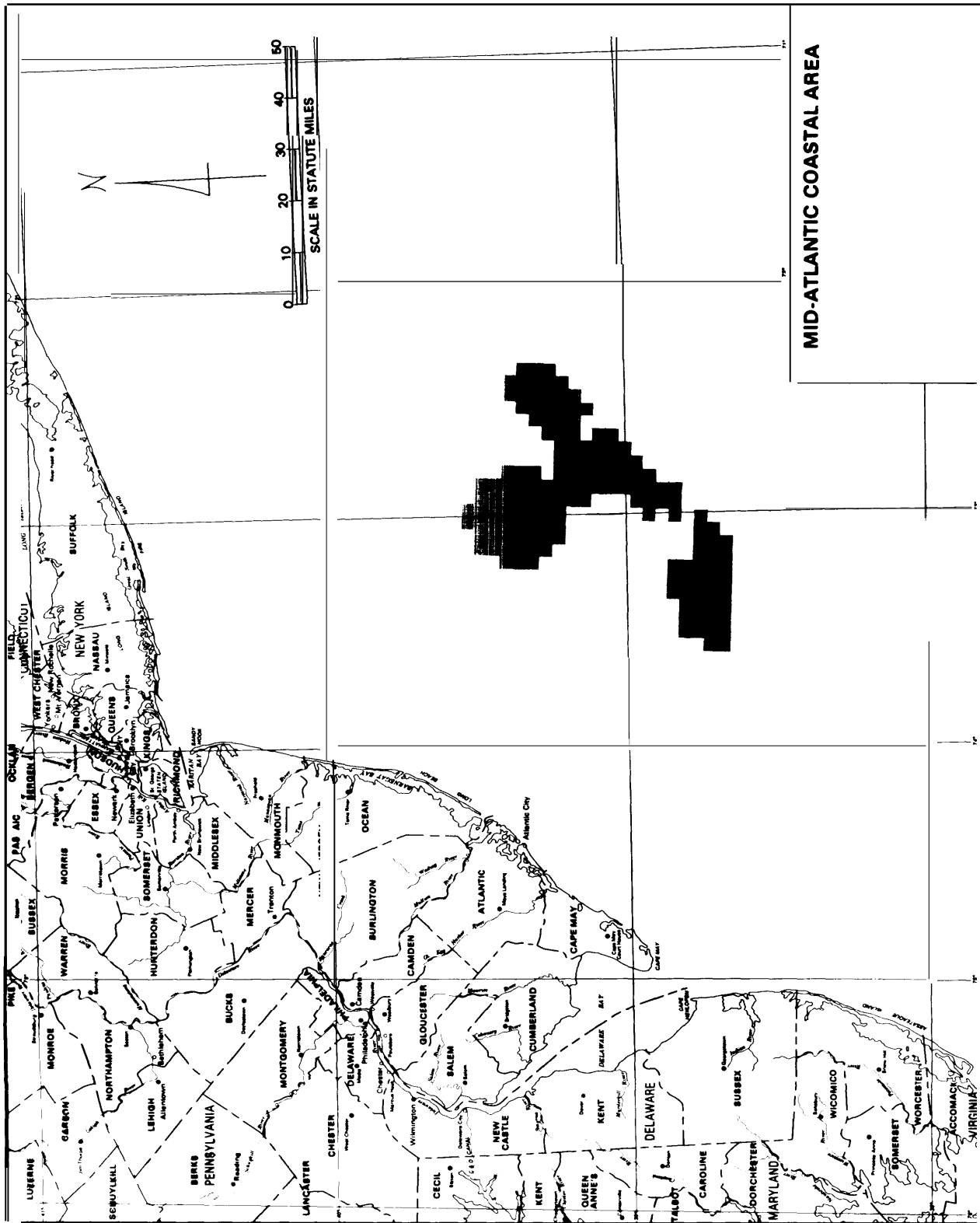
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Figure III-1.



Source: Office of Technology Assessment and U S Department of the Interior

Figure III-2.



Source Office of Technology Assessment and U S Department of the Interior

2. Traffic patterns off the Mid-Atlantic coast tend to pass directly through potential rig locations while those in the Gulf have, to date, circumvented major concentrations of rigs.
3. The weather conditions, including wind, sea-state and fog, are more severe for longer periods of time in the Atlantic than in the Gulf.

The Maritime Administration of the Department of Commerce has agreed these factors increase the risk of contact between ships and structures, but Commerce believes that if all offshore structures are precisely marked and made known to mariners and equipped with warning lights, sound signals, and radar beacons or transponders, vessels should be generally able to avoid them without traffic control systems. Traffic control systems affect the speed, route, and fuel consumption of waterborne commerce, according to a Department spokesman. Because of this adverse economic impact on the shipping community, Commerce is reluctant to have new traffic control systems instituted.

In addition to commercial shipping vessels, more than 275 commercial fishing vessels operate out of New Jersey and Delaware and large numbers of fishermen from New England and the South Atlantic States operate in the offshore region nearby. Foreign fishing outside the 12-mile limit also is substantial. The number of foreign fishing ships sighted was more than 100 in one month in the Mid-Atlantic during the past year.

The fin fishing and scalloping areas which are of prime importance to U.S. fisheries cover a large portion of the Baltimore Canyon lease areas under consideration. Several areas proposed for leasing have been excluded from the proposed lease sale by the Interior Department at the request of the Atlantic Offshore Fish and Lobster Association. a

Sport fishing is very extensive in the New Jersey-Delaware offshore region, but statistics are not available to document numbers of vessels or fishermen currently utilizing this area. Many charter fishing boats and larger private sport-fishing boats regularly voyage offshore, and various angler's guides show locations of tuna, marlin, dolphin, bluefish, and other species in the region of proposed leasing. Offshore structures may attract marine life and encourage an increase in fish population

density, which is considered an advantage by many sport fishermen.<sup>5</sup>

## **CONGRESSIONAL OPTIONS**

Some of the options available to Congress for minimizing offshore conflicts are:

1. Congress could expand the authority of the U.S. Coast Guard to give it jurisdiction to establish an effective offshore traffic control system. Such authority already exists for Coast Guard jurisdiction over navigable waters and areas around deepwater ports.
2. Congress could authorize specific studies of conflicts in ocean uses and means to resolve them.

## **OTHER OPTIONS**

1. Departments of Transportation and the Interior could draw up a memorandum of understanding in which they agree to a system for resolving conflicts between vessel traffic and OCS oil and gas activities.

2. Industry, with or without Department of the interior regulations, could deploy as many subsea completions on oil and gas wells as is practical and economically possible to reduce the number of surface structures required for OCS production.

3. Informal planning groups, with the industries and public involved, could be established to resolve conflicts.



## Tanker Design and Operations

Tanker spills are the source of 5 to 15 times as much oil as all offshore drilling and port operations combined yet pollution control regulations are far less stringent for tankers than for either deepwater ports or offshore oil and gas operations.



Deepwater Ports

### FINDINGS

1. Tankers accidentally spill 200,000 tons of oil each year, worldwide, and 12,000 tons in waters within 50 miles of the U.S. coast due to accidents of all kinds.

2. The major causes of these accidents are structural failure, collisions, rammings, and grounding, many of which are in turn caused by human error.

3. Tankers deliberately discharge 1 million tons each year, worldwide, and some unknown portion of that in waters off the U.S. coast in routine ballasting and tank cleaning operations. Such discharges are illegal within 50 miles of the U.S. coast.

### Public Participation Comments

It is a pleasure to read the report on the findings of the study. The report is well written and provides a clear and concise summary of the findings. The report is a valuable resource for anyone interested in the issue of tanker design and operations.

### DISCUSSION OF THE ISSUE\*

Equipment used in deepwater ports appears to have performed well in many worldwide applications. But the supertankers which utilize the ports are far less dependable and greater efforts are needed to reduce tanker-caused pollution to acceptable levels.

Several changes in tanker design and construction have been proposed to reduce pollution. Such design improvements include: double bottoms and double hulls, inert gas systems, added maneuvering devices, improved navigation systems, and improved tank cleaning and ballasting systems.<sup>1</sup> Regulations regarding some of these have been challenged however, largely by industry groups on the grounds that the resulting reduction in the amount of oil spilled would be small in relation to total oil pollution.

The report is a valuable resource for anyone interested in the issue of tanker design and operations. The report is well written and provides a clear and concise summary of the findings. The report is a valuable resource for anyone interested in the issue of tanker design and operations.

\*This brief discussion of this issue is drawn from the full text of "The Possibility of Deepwater Ports in the Mid-Atlantic," chapter IV, particularly pages 195—196.

Oil spill statistics do not support assigning priority to any single improvement, but a case can be made that several design and operational changes together would substantially reduce oil pollution. A total system approach is needed to balance construction improvements with operating improvements such as traffic control and training.

The Ports and Waterways Safety Act of 1972 authorizes the U.S. Coast Guard to regulate design, construction, and operations of U.S. tankers and foreign flag tankers operating in U.S. waters. Regulations for U.S. tankers in domestic trade have been issued. Proposed rules for U.S. flag tankers engaged in foreign trade and foreign flag tankers in U.S. waters were published on April 15, 1976. The closing date for comments on these rules was June 12, 1976, and a final environmental impact statement was under review in August.

Hearings were held by the Senate Commerce Committee on March 2 and 3, 1976, at which witnesses expressed concern about the adequacy of Coast Guard tanker regulations. They questioned whether best available technology was, in fact, being required and Alaska said it would join other Western States in imposing regulations of its own on supertankers entering its ports. The Coast Guard testified that its regulations were based on thorough consideration of best technology and priorities of concern not only within the United States but worldwide. Industry representatives supported the Coast Guard position and pointed out that the Federal Government, not the States, has jurisdiction over interstate and foreign commerce matters, as defined by the Constitution. z

The problem of reducing pollution from tankers is compounded by economics and international politics. s

First, the most economical oil tanker transportation systems use methods that many authorities believe must be changed to reduce pollution. Needed are design improvements, which add costs for the operator; training and licensing programs, which may be financed by both government and operators; and improved traffic control and cleanup techniques, which also may be financed by both. It is not possible to project cost/benefit figures for pollution because few pollution damage costs have been quantified, because the effectiveness of many prevention

measures cannot be quantified, and because the economics of tanker transportation are subject to extreme variations.

Second, there is controversy over the question of multilateral versus unilateral regulation of tankers in U.S. waters.

One school of thought is that international agreements are the best way of dealing with international trade problems and pollution control measures. One drawback to this approach is that international conventions have a history of extremely slow adoption and poor enforcement. The 1973 International Pollution Convention has developed tanker standards which would make substantial improvements, but they are not yet in effect because they have not been ratified by a majority of signatory nations—including the United States. As of mid-1976, only three countries had ratified it and it appears that the earliest implementation would be 1980 to 1983. Existing U.S. Coast Guard regulations on tanker construction and operation closely parallel the 1973 agreement but many States and environmental groups claim that U.S. regulations should be substantially stricter than international standards.

Another school of thought is that the United States should take unilateral action to improve tanker standards. Opponents of that approach claim that action by the United States to make more stringent rules without similar adoption internationally may make the U.S. tanker fleet less competitive. Ninety-four percent of U.S. imports are carried by foreign flag tankers and if the United States tries to enforce stricter standards on the foreign fleet, it could interrupt supplies.

Many environmental groups argue that the United States, through major oil companies, does control most foreign flag ships and that the United States is a major tanker customer for an industry that now needs customers.

By the end of 1976, about half of the world tanker fleet will be surplus to need, partly because of overexpansion and partly because the world recession sharply cut oil demand. Tanker owners are looking to the United States to take up much of the slack because U.S. imports are more likely to increase sharply than imports by other countries. The situation may provide substantial leverage

for the United States to set standards for operation of foreign flag ships in U.S. waters.

Many States and environmental groups support the fact that the major reduction in operational discharges by tankers can be made by requiring segregated ballast systems aboard vessels so that ballast water is never mixed with oil. The Coast Guard has just published advance notice of proposed rules which would require such segregated ballast systems for all tankers over 70,000 dwt utilizing U.S. ports.<sup>4</sup> The proposed rules would apply to both foreign and domestic tankers. If adopted, this requirement would be a major improvement in regulation of tankers using deepwater ports. Comments on these proposed rules are now being evaluated by the Coast Guard.

### **CONGRESSIONAL OPTIONS**

Among the options available to Congress for dealing with tanker technology issues are the following:

1. Congress could require the U.S. Coast Guard to analyze the causes of oil spills so that priorities may be set for implementing design and operations standards for supertankers calling at U.S. deepwater ports.
2. Congress could require the U.S. Coast Guard to develop specific regulations for supertankers using deepwater ports in the United States.
3. Congress could provide economic incentives for U.S. importers to encourage them to charter only those tankers that meet high standards of design and operations.

### **OTHER OPTIONS**

States could impose their own rules and regulations for operation of tankers and deepwater ports in their waters.

# Oil Spill Containment and Cleanup at Deepwater Ports

The use of offshore deepwater ports may reduce the risk of certain oil spills and environmental damage below that of transporting crude oil by smaller tankers into the congested New York Harbor and Delaware Bay. Even the very small risk of a catastrophic spill from a supertanker, however, dictates that stringent pollution control and cleanup systems be used.

## FINDINGS

1. Even the most advanced Coast Guard equipment for high-seas containment of oil spills would be effective in winter seas off Delaware and New Jersey only 55 percent of the time.

2. Because of the serious limitations of containment and cleanup equipment, emphasis should be on preventing spills rather than on regulations for cleanup equipment.

3. Regulations for preventing spills from a deepwater port appear to be adequate. However, regulation of tankers using the ports can be improved greatly.

## DISCUSSION OF THE ISSUE\*

Department of Transportation regulations require that deepwater port operators have onsite equipment for containing and cleaning up spills of less than 1,000 barrels, but equipment for dealing with larger spills is not required onsite. Such equipment need only be "readily accessible" to the operator.<sup>1</sup>

Most of the equipment needed for dealing with large-scale spills from deepwater ports or tankers is maintained by the Coast Guard. The Coast Guard has recently developed oil pumpout and salvage equipment for use in major tanker accidents and containment and cleanup equipment for rough waters; it is not likely that privately built equipment would handle large volumes of oil in rough seas as effectively. However, even the Coast

1.



Deepwater Ports

## Public Participation Comments

The supertanker ports would be unacceptable to me unless new regulations were enforced in order to reduce the chance of major oil spills. At present, company policies and lax enforcement of self-regulation have caused a lot

of lightering operations are so risky, pollute heavily, and expensive to boat and a deepwater port can't come soon enough. But remember, spill containment is most important, unless extensive planning for damage cleanup is included in the design.

\*This brief discussion of the issue is drawn from the full text of "The Possibility of Deepwater Ports in the Mid-Atlantic," chapter IV, particularly pages 193-195.

Guard gear, which would be used under the provisions of the national contingency plan for an oil spill emergency, has strict operational limits.

Even the most advanced Coast Guard system for high seas oil containment is only effective in waves under 5 feet, currents of 1 knot or less, and winds of up to 20 knots. Winter seas off New Jersey and Delaware, where a deepwater port might be located, exceed these limits 45 percent of the time.<sup>2</sup>

Development of containment and cleanup systems which would more adequately handle large volumes of oil and would be dependable in rough seas would require a large commitment of money and technical expertise.

In addition to the limitations of existing equipment, projections of the movement of oil at sea are limited and little data is available for use in predicting the path an oil slick will take or when it will come ashore.

If a spill does reach shore, there is little equipment available for use in cleaning up beaches and wetlands. What is used is costly and inefficient.

Therefore, OTA has concluded that the emphasis must be on preventing oil spills rather than on requirements for cleanup and containment equipment. Regulations for preventing spills from a deepwater port itself appear to be adequate; however, regulations for tankers using the ports can be improved greatly. (See Issue 10: Tanker Design and Operations.)

A lack of reliable statistics and analysis of causes and effects of oil spills hampers every effort to assess the risk and damage of oil spills.

The Coast Guard operates a Pollution Incident Reporting System which gathers and stores data on all spills in U.S. waters. The Coast Guard also collects world data on ship accidents and prepares some analysis of causes. These world statistics are much more relevant to the deepwater port question than U.S. figures because there are no deepwater ports operating in the United States as yet. But the world data are not well enough verified to be usable in forecasting nor does it document causes or trends in accidents and resultant spills.

"...it may be argued that while a decrease in number of vessels [and] fleet reduces the chances of an oil spill, the increase in severity of an accident offsets this consideration."

"...deepwater ports should be far enough offshore to permit prevention pickup before it could reach the beaches. All facilities should be purchased, maintained, and operated by private industry."

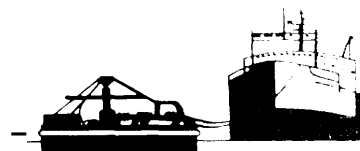
### CONGRESSIONAL OPTIONS

Among the options available to Congress in resolving problems relating to oil spills in the deep-water port system are these:

1. Require the Department of Transportation's Deepwater Port Project Office to report annually on oil spill cleanup technology and contingency plans for each proposed or operating deepwater port. These reports should contain the status of research and data efforts concerning oil spill statistics, causes, and effects so that it could be determined if operators are using the best available systems.
2. Expand research efforts within the Coast Guard, NOAA, and the Environmental Protection Agency on trends, causes, and effects of oil spills. The trend data base could be improved by expanding the scope of the National Transportation Safety Board to permit it to conduct an investigation of the causes of any major accident involving supertankers and deepwater ports abroad.
3. Require a case study of response time, containment, and cleanup efforts used in every major spill in order to determine whether existing equipment and systems are used to the best advantage and to identify areas where changes are needed.

# Standards in State Waters

Under existing Federal law, operators of deepwater ports in State waters could ignore the safety and environmental pollution standards that apply to ports outside the 3-mile limit.



Deepwater Ports

## FINDINGS

1. Deepwater ports in State waters will be licensed by the U.S. Army Corps of Engineers, which is not obliged to require the same standards for construction and operation that are set by the Department of Transportation under the Deepwater Port Act of 1974.

2. The law does not require a Coast Guard Vessel Traffic Surveillance System for deepwater ports in State waters, and budget priorities conceivably could delay installation of such a system for a port in State waters.

## DISCUSSION OF THE ISSUE\*

Deepwater ports in a State's territorial waters or in inland waters such as the Delaware Bay would not be subject to the Federal Deepwater Port Act. All ports within 3 miles of shore would come under the jurisdiction of the U.S. Army Corps of Engineers, of the States, and of any regional commissions or authorities to which States had delegated authority. For example, the Delaware Bay Transportation Co. plan for a deepwater port would not be covered by the Deepwater Port Act.

Since the permit authority the Corps of Engineers could exercise over a near-shore port facility does not at this time include a requirement that ports comply with the same Federal standards as deepwater ports outside the 3-mile limit, there is no guarantee that they would meet minimum safety and environmental standards set at the Federal level to protect the national interest and interests of States other than the host State.<sup>1</sup>

\*This brief discussion of the issue is drawn from the full text of "The Possibility of Deepwater Ports in the Mid-Atlantic," chapter IV, particularly pages 185-186.

## Public Participation Comments

"We find your suggestion of a cooperative agreement between the Corps and the Department of Transportation to cover the installation of deepwater ports within the U.S. territorial limits an interesting one and one which possibly would help in addressing potentially serious environmental concerns raised by pending developments."

February 1974



The Corps of Engineers may issue permits on the basis of its own judgment of an applicant's design, without regard to DOT regulations for deepwater ports beyond the 3-mile limit. By the same token, the Corps could require ports under its jurisdiction to comply with construction and operation regulations promulgated under the Deepwater Port Act.

The States retain influence over the Corps in permit decisions because an applicant must certify to the District Engineer that the activity conforms to the coastal zone management program of the State involved. If a State has laws that regulate deepwater ports, the Corps will issue a permit only if the State approves.

Under existing Federal law, the Coast Guard is required to install a traffic surveillance system for deepwater ports in Federal waters, but there is no such requirement for ports in State waters. Therefore, the Coast Guard would not be obliged to improve traffic controls in the Delaware Bay for a port proposed by the Delaware Bay Transportation Co.

Briefly, the Vessel Traffic Surveillance (VTS) system is an additional source of information with backup radar capability intended to contribute to the safe operation of vessels. It functions much the same as an air traffic control system.

The Coast Guard does have jurisdiction over VTS within the 3-mile limit under the Ports and Waterways Act of 1972, and is installing surveillance systems in major U.S. ports on a schedule dictated largely by budget considerations. Those budget considerations and prior commitments could mean that VTS would not be implemented in deepwater port areas in State waters as quickly as it is in offshore ports.

In addition to the possible lack of safety and environmental standards, deepwater ports in State waters would lack coverage under the insurance and liability sections of the Deepwater Port Act. That Act makes compensation available only to persons damaged as a result of spills related to ports licensed by the Federal Government. That means that each State with a deepwater port within its waters must develop its own comprehensive liability and compensation plan to protect its citizens and property holders and those of neighboring States which might be affected by a spill.

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## CONGRESSIONAL OPTIONS

Possible courses of action available to Congress for resolving discrepancies in the laws governing construction and operation of deepwater ports in U.S. territorial waters and ports inside the 3-mile limit include:

1. Congress could amend the Deepwater Port Act to cover all ports, including those inside the 3-mile limit.
2. Congress could amend the law to require a vessel traffic surveillance system as a condition of operating a deepwater port under the jurisdiction of the Corps of Engineers.
3. Committees of Congress with jurisdictional authority could advise the Corps of Engineers to delay approval of deepwater ports until funding for a surveillance system was assured.
4. Congress could accelerate funding for surveillance systems generally, or it could provide special funding authority to the Coast Guard to meet requirements in specific port areas.
5. Congress could require, either formally or informally, that the Corps of Engineers comply with DOT standards for deepwater port construction and operation.

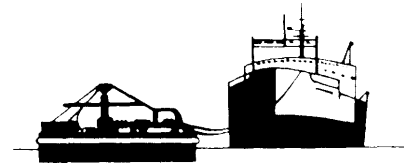
## OTHER OPTIONS

1. States could enact laws for deepwater ports in their waters that were modeled on the Deepwater Port Act of 1974.

2. The Department of Transportation and the Corps of Engineers could develop, by memorandum of understanding, identical standards for deepwater port construction and operations in State waters.

# Adjacent Coastal State Status

Differing interpretations of statutory criteria for determining adjacent coastal State status make it difficult to predict which States could qualify for that status in the future and whether some States may be deprived of the benefits of such status.



Deepwater Ports

## FINDINGS

1. A recent denial by the Secretary of Transportation of a Florida petition for adjacent coastal State status focused attention on disagreement among Federal officials and among State governments and other interested parties as to how statutory criteria for determining adjacency should be interpreted and applied.

2. The Secretary's decision left unresolved the question of whether tankers in transit to and from a deepwater port can ever be considered a factor in determining adjacent coastal State status.

3. If tankers in transit are to be considered, it is not clear whether the determining factor is only the increased risk to the petitioning State from tanker spills related to a deepwater port, or whether relative risks among the States should be compared, regardless of whether overall risks are increased or decreased by a deepwater port.

## DISCUSSION OF THE ISSUE\*

The Deepwater Port Act gives adjacent coastal States a role in approving or disapproving a license and an opportunity to benefit from the protections offered by law. Unless a State is located within 15 miles of a deepwater port or connected by pipeline to such a port, the Secretary of Transportation makes the final determination of which States are to be considered "adjacent."

An adjacent coastal State is entitled; to veto a pro-

## Public Participation Comments

"As you may be aware, Florida has now taken the matter to court and it may fall upon the judiciary to determine whether the law as written would grant Florida the adjacent State status it desires."

Environmental Off

"I, personally, am convinced that that portion of the Act needs to be more clearly written in order to make it perfectly clear that States affected by tankers in transit to and from deepwater ports should be automatically granted special status."

to the Act

\*This brief discussion of the issue is drawn from the full text of "The Possibility of Deepwater Ports in the Mid-Atlantic," chapter IV, particularly page 139.

posed port, to collect fees for environmental or administrative costs related to such facilities, and to receive priority over private applicants for a license to construct and operate a port. Because of the benefits of adjacent coastal State status and the fact that there are a large number of coastal States close together in the Mid-Atlantic region, several States may ask to be designated “adjacent” if a deepwater port should be proposed for licensing off the coast of New Jersey and Delaware.

The Act specifies that after having received recommendations from NOAA and the Coast Guard, the Secretary shall designate a petitioning State as “adjacent” if he determines that there is a risk of damage to the coastal environment of said State equal to or greater than the risk to a State directly connected by pipeline to the proposed port. Recently, Florida asked to be declared an adjacent coastal State in connection with the licensing of LOOP and Seadock deepwater ports off Louisiana and Texas. The Florida case brought attention to the fact that different interpretations of the statute could lead to different determinations as to whether a State’s petition is granted or denied. ] This lack of criteria for applying the statutory language to a specific situation may also figure in any applications for adjacent status made by Mid-Atlantic States.

Florida petitioned for adjacent coastal State status on grounds that the risk of an oil spill along its coastline from tankers moving through the Florida Straits to and from the deepwater ports posed a danger equal to, or greater than, the risk to either Texas or Louisiana, which are automatically “adjacent” by statutory definition.

Based on his interpretation of the statute, the Secretary of Transportation denied Florida’s petition. In arriving at his decision, the Secretary considered the opinions of the National Oceanic and Atmospheric Administration and the Coast Guard, the two congressionally mandated “expert” agencies which advise the Secretary in an “adjacency” case. NOAA concluded that risk of damage to the coastal environment of Florida from proposed LOOP or Seadock is equal to, or greater than, the risk posed to the coastal environment of Texas or Louisiana, and would thus warrant granting adjacent coastal State status to Florida.<sup>2</sup> The Secretary acknowledged that the risks to Florida from tankers in transit were greater than, or equal to, those of Louisiana or Texas. However, instead of

“I have some concern over the suggestion that NOAA prepare general criteria to be considered in designating adjacent coastal states. The dangers involved in an adjacent coastal state decision go beyond the more technical expertise of NOAA. A more appropriate criteria for this designation should be developed we feel than that developed by the Department of Transportation as the lead agency, with input from NOAA.”

basing his decision on a comparison of relative risks to which the States were subjected, the Secretary, on the basis of Coast Guard data, concluded that the risks to Florida from tankers in transit would exist whether or not the ports were built, and Florida's petition was not granted.<sup>3</sup>

The Secretary justified his decision by stating that the intent of the Act was to concern itself "with those environmental hazards that were to be generated by the (deepwater port) program it was authorizing—that is, with those risks that would be created by the construction of the ports in question." He concluded that because the deepwater port program itself did not create additional risks to Florida from tankers in transit, that was not a class of risks that Congress intended the Secretary to consider in his determination.<sup>4</sup> NOAA's interpretation is that the legislative history of the Act shows that reduction of small tanker traffic is one of the main justifications cited by Congress in support of passage of the Act. Because Congress already assumed this to be a benefit of deepwater ports, the provisions for declaration of adjacency could be viewed as an additional environmental safeguard or mechanism for assuring that States subjected to risks equal to, or greater than, adjacent States would participate in the decisionmaking process, and share in the benefits of adjacency.

More important, in arriving at its recommendation, NOAA determined that the Act mandates a comparison of the risks between the States, and that if tankers in transit are considered, the risk of damage to each respective State must be compared, regardless of whether the overall risk to all States was reduced.

Transportation Department officials said in later discussions with OTA that although tankers in transit were not a determining factor in the Florida case, they could be so considered in the Mid-Atlantic if a State could show that a port would cause a change or "distortion" in existing tanker traffic patterns that would result in an increase in the risk of oil spills. s However, it is not clear whether the Secretary's decision has set a precedent that would be inconsistent with this type of consideration.

Industry officials have complained that applications for adjacent status may add to the costs of deepwater ports by delaying construction. However, the law requires all interested States to apply for adjacent status

within 14 days after a deepwater port application has been published in the *Federal Register*. The maximum delay that can result from the process of naming adjacent coastal States, regardless of the number of States involved, is 114 days. But industry might be subject to higher costs and more restrictions on the construction and operation of the port as a result of State stipulations and charges if several States are granted adjacent status.

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### CONGRESSIONAL OPTIONS

1. Congress could specify whether the risk of pollution from tankers passing a State's coastline to or from a deepwater port should provide grounds for declaring a State adjacent regardless of whether such ports increase or decrease risks from tankers in general.

2. Congress could specify whether the comparison of risks mandated in the Act (i.e., equal to or greater than the risks to a State connected to the port by pipeline) should be the only determinant of adjacency or whether this should be the key factor only in the context of overall increase or decrease of risks from a deepwater port to all relevant States.



Regulatory Commission that compares the radiological consequences of accidental releases of radioactive materials into water at floating nuclear plants and land-based nuclear plants is not as comprehensive as *WASH-7400's* analysis of the consequences of accidents because it does not translate radiological doses into health effects and does not consider economic impacts.

4. Certain aspects of the proposed site for the Atlantic Generating Station, such as the fact that the prevailing summer winds tend to blow from the Atlantic Generating Station site towards an island having a peak summer recreational population of more than 100,000, make it impossible to apply *WASH-1400's* conclusions about the expected consequences of airborne releases to the Atlantic Generating Station.

5. A substantial amount of information is available that could be used to assess the consequences of a core-melt in a floating nuclear plant, and research programs are underway to provide additional applicable information. There do not appear to be any significant information needs that will not be satisfied by research programs already underway.

#### DISCUSSION OF THE ISSUE\*

The environmental and health effects of normal operations of a floating nuclear powerplant have been studied extensively by Government and industry analysts. A critical review of these studies discloses little foundation for concluding that either construction or routine operations of two plants at the Atlantic Generating Station would pose a substantial threat to public health or the environment.

However, while routine operations appear to pose few problems, the most serious accident that could occur in a nuclear powerplant—a meltdown of the fuel core—could pose a severe threat to public health and safety and to the environment. While operation of any nuclear powerplant involves some accident risks, a core-melt in a floating nuclear powerplant may involve unique risks since the molten core probably would melt through the

"Development of new technologies and ways accompanied technical progress. Problems can be solved by taking care of them as they arise, rather than trying to anticipate them, might be and prevent or prevent great hazards."

"I doubt that a floating nuclear powerplant for the sea in construction of floating powerplants; this chance of an accident is greater than in a land-based plant."

"There are no alternative development and construction nuclear powerplants. They must regardless of extent that they are safe and

\*This brief discussion of the issue is taken from the full text of "The Proposal for a Floating Nuclear Powerplant in the Mid-Atlantic," chapter IV, particularly pages 230-237.



bottom of the floating platform and release large quantities of radioactive fission products directly into the body of water on which the plant is floating. Public concern about the risks from floating nuclear plants is reflected in the responses to OTA's public participation questionnaire, the contentions of interveners in the licensing process, and the State of New Jersey's request to the Nuclear Regulatory Commission for an assessment of such risks.

Recognizing that floating nuclear powerplants present unique safety issues, the Advisory Committee on Reactor Safeguards directed Offshore Power Systems to perform a number of studies related to these unique issues. As a followup, the Nuclear Regulatory Commission decided to conduct a general study of the radiological consequences of a release of radioactive materials into water from both land-based and floating plants. This Liquid Pathways Generic Study, scheduled to be published in draft form in late-1976, will analyze the consequences of releases from a wide range of accidents; from relatively minor ones to the most serious case, the core-melt. When completed, it will be published as a Nuclear Regulatory Commission study and will be considered in the licensing process for both environmental and safety reviews of the Offshore Power Systems application for a license to build eight floating nuclear powerplants.

By injecting into the licensing process a study which includes analysis of some of the consequences of a core-melt accident, the Nuclear Regulatory Commission appears to have taken a step away from its policy of not requiring any consideration of core-melt accidents in reviewing and approving applications for licenses to build and operate nuclear powerplants. However, it should be noted that there has been no change in the formal requirements for licensing, because the final environmental statement on the Offshore Power Systems application will contain only an analysis of the consequences of accidents less severe than a core-melt.

OTA concludes that the accident risks posed by the new technology of floating nuclear powerplants deserve thorough study. The analysis that supports the conclusion must begin with an examination of the way in which powerplant safety is treated under current Nuclear Regulatory Commission procedures.

"The quality of life on this planet is being degraded and its very existence threatened by large-scale nuclear fission such as used in power production. "

Environmental Official

"What's wrong with enlarging a floating nuclear power plant to include a resort hotel and offshore gambling ? Heated waters could be used for central heating systems, heated swimming pools, etc General public would eventually overcome science fiction - stimulated fears of nuclear power

New Jersey Citizen

"True, there are remote dangers but I am familiar with Oyster Creek Nuclear Plant and would not hesitate to live next door

New Jersey Citizen

"I do not believe that offshore powerplants can survive the storm potential of the Jersey Coast

New Jersey Citizen

The Commission's objective is "to assure that the risk from normal operation and postulated accidents is maintained at an acceptably low level and to assure that the likelihood of more severe accidents is extremely small."<sup>4</sup>

The Commission attempts to meet the objective with three levels of regulations in which it:

- Establishes standards for the design, construction, and operation of nuclear powerplants that are intended to keep the probability of failure or malfunctions at a low level.
- Requires equipment and emergency procedures to cope with malfunctions that do occur, such as an emergency control mechanism that will terminate a fuel core's chain reaction under abnormal plant conditions.
- Requires safety systems to control a worst-case set of "design-basis accidents", such as a loss of a reactor's primary coolant that might lead to a core-melt unless auxiliary cooling systems were available.

The Commission divides the spectrum of postulated nuclear powerplant accidents into nine categories, ranging from minor incidents (Class 1) to the potentially catastrophic but highly improbable core-melt (Class 9). Commission policy requires only Class 1 through Class 8 accidents to be considered in licensing designs and sites for powerplants.

Class 8 accidents include ejection of a fuel rod, a crack in a steam line and, most importantly, a loss-of-coolant-accident (LOCA) involving a major break in one of the lines carrying the water that transfers heat from the core to the steam system. The LOCA is one of two possible initiating events for a core-meltdown. The other is a temporary disruption of the system—known as a transient—which raises core temperature above the capacity of the cooling system. If a LOCA were followed by proper operation of the engineered safety features, such as the Emergency Core Cooling System (ECCS), it would be considered a Class 8 accident; if these systems failed and the core overheated and melted, it would be a Class 9 accident. The consequences of Class 9 accidents could be far more severe than the Class 8 accidents,

"The nuclear energy proposal would result in the 'cleanest' way of helping to develop our resources without unnecessarily endangering man."

—Nuclear Energy Review

"There is always risk in developing more energy resources but but we have no alter natives but to keep developing so lvin g the problems as best we can."

—Nuclear Energy Review

because they could release substantial quantities of radioactive materials into the environment.

The NRC's rationale for not requiring consideration of Class 9 accidents in the design basis of protection systems and engineered safety features or in evaluating proposed sites is that the probability of their occurrence is judged to be so small that the total risk from such accidents (the probability of an accident multiplied by the expected consequences of the accident) is extremely low; so low that they can be safely ignored, even though their consequences could be far worse than those of other malfunctions.

Until 1975, this judgment was not supported by detailed analysis of the probabilities or consequences of various classes of accidents. In that year, the NRC received the final results of the Reactor Safety Study (WASH- 1400). This was intended to develop realistic estimates of the probabilities of major accidents, and of their public health consequences (such as death and illnesses) and economic costs (such as evacuation, decontamination, crop losses, and loss of productive use of quarantined land).

The report was issued in final form on October 30, 1975. It estimated that the probability of a core-melt accident in a land-based pressurized water reactor plant is about one in twenty thousand per year of reactor operation, and that only about one in seven core-melt accidents would lead to the release of significant amounts of radioactive materials into the atmosphere. It also concluded that the risks from operating 100 nuclear power reactors were small compared to other man-made and natural risks. While the Nuclear Regulatory Commission has not yet announced whether, or how, the results of the study will affect nuclear safety regulations, it did state after completion of the draft report that "the very low resultant risk described in the draft study amply justifies the conclusion that no immediate action is required or appropriate as a result of the draft study's present assessment of the probabilities and consequences of core-meltdown." <sup>5</sup>NRC's view does not appear to have changed after publication of the final report.

The validity of the conclusions of *WASH- 1400* concerning the absolute level of risks from nuclear powerplants is a matter of controversy, as is reactor

safety in general. Any resolution of this controversy is far beyond the scope of this study. Consequently, OTA's consideration of *WASH- 1400* was confined primarily to determining whether there are grounds for concluding that there are significant differences in the risks associated with floating nuclear powerplants and land-based plants, recognizing that there is disagreement over whether the risks associated with land-based plants are fully understood. It should be noted, however, that results presented in (Draft) *WASH- 1400* imply that whatever the absolute level of risks from all classes of reactor accidents may be, the total risks from Class 9 accidents are greater than the risks from Class 8 accidents, because the lower likelihood of Class 9 accidents could be offset by their greater potential consequences.<sup>6</sup> This finding supports OTA's conclusion that it would be advisable to conduct a realistic, comprehensive analysis of the overall risks from core-melt accidents in floating nuclear powerplants, even though current NRC regulations require analysis of accidents only through Class 8.

As noted earlier, the Liquid Pathways Generic Study does appear to represent a move away from the policy of not considering Class 9 accidents at all in the licensing process, although there has been no change in the formal licensing requirements. However, this study is not, and does not purport to be, a comprehensive comparison of the risks of floating plants with those of land-based plants similar in scope to *WASH- 1400*. Specifically, it considers only liquid pathways for dispersion of radioactive releases; it does not translate calculations of radiation doses into health effects; it does not consider economic impacts; and it considers only the consequences of an accident at a single plant, rather than attempting to calculate the risks of operation of a considerable number of floating plants.

OTA's comparison of the reactor used in the floating nuclear powerplant with the pressurized water reactor examined in *WASH- 1400* indicated that even though the probabilities of a core-melt appeared similar for both plants, the *WASH- 1400* conclusions concerning the risks from airborne releases could not be directly applied to floating plants because of design differences affecting the probabilities and magnitudes of atmospheric releases from a core-melt. Furthermore, the wide range of sites on which *WASH- 2400* risk calculations were based did not

reflect the more limited range of sites available to floating plants.

Thus, OTA concludes from its examination of the Liquid Pathways Generic Study and *WASH-1400* that substantial additional analysis will be needed to produce a comprehensive generic comparison of the risks from floating nuclear powerplants with those from land-based plants. However, its examination of related research indicates that most of the information needed for such an analysis should be currently available or forthcoming from active research programs.

OTA also concludes that both the Liquid Pathways Generic Study and *WASH-1400* have limited applicability in assessing the potential impacts of deploying floating nuclear powerplants in the study area. The calculations of expected consequences of accidents in *WASH-1400* are based on site characteristics averaged over 68 sites expected to be in use by 1981. The averaging technique used makes it impossible to determine how the characteristics of specific types of sites affect consequence calculations. Specifically, there are characteristics of the proposed Atlantic Generating Station site that suggest that consequence calculations based on average site characteristics would be misleading. For example, the economy of the region around Atlantic City depends heavily on summer recreational use of the beaches and the ocean; hence an accident that released large quantities of radioactive materials into the ocean could have a severe economic impact, both in the short run, through the effects of a limitation on use of the beaches and ocean in the area, and in the long run, through adverse effects on the attractiveness of the area for recreation relative to other areas. The potential severity of the impact of a major accident on the regional economy also highlights the limitations of the Liquid Pathways Generic Study, which does not analyze economic effects.

Another site-specific factor which could increase the consequences of a major accident is the fact that the prevailing winds during the peak summer tourist months would tend to carry radioactive releases produced by an accident towards Long Beach Island, whose southern tip is 2.8 miles north of the Atlantic Generating Station site, and whose year-round population of about 10,000 can reach a summer daytime peak of more than 100,000. This potential problem is compounded by the fact that only

one bridge is available for evacuation of the island in case of an accident.

Neither *WASH-1400* nor NRC procedures for analyzing the consequences of design basis accidents take into account correlations between wind direction and seasonal population peaks.

These peculiarities of the proposed Atlantic Generating Station suggest that a site-specific analysis would be required to assess the expected consequences of a major accident. A recent review of *WASH-1400* indicates that differences in population distribution around various sites considered in *WASH-1400* can affect the expected consequences (and hence the risks) of serious accidents by factors of *one* thousand or more.<sup>7</sup> NRC regulations already require site-specific analysis of the radiological (but not economic) consequences of accidents through Class 8. Since *WASH-1400* implies that the total risks from Class 9 accidents are greater than those from Class 8 accidents, the sensitivity of risk to site characteristics suggests that site-specific analyses of consequences of core-melts could be useful in decisions concerning siting alternatives. It should be noted that M. Bender and S. H. Bush of the Advisory Committee on Reactor Safeguards have expressed opinions supporting this view in the June 7, 1976, "Interim Report of the Floating Nuclear Power Plant," sent to Marcus Rowden, Chairman of the NRC.

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## CONGRESSIONAL OPTIONS

Congress has delegated authority to the Nuclear Regulatory Commission to exercise most of the options that OTA's analysis shows are available for dealing with questions about safety of floating nuclear powerplants.

Where powers have been delegated to NRC, the options open to Congress include:

- . An informal notice to the Nuclear Regulatory Commission that it would support programs to exercise the options;
- A more formal inquiry through the hearing process into the validity of exercising the options; and, finally

- . A formal instruction to the NRC to exercise any of the options that seemed appropriate to Congress or committees with jurisdiction.

The specific options that OTA's analysis shows are available are:

1. The Nuclear Regulatory Commission could carry forward OTA's preliminary analysis of the probabilities of core-melts and associated atmospheric releases of radioactive material in floating nuclear powerplants as compared to land-based plants.
2. The NRC could expand the scope of the Liquid Pathways Generic Study to include the economic consequences of airborne and waterborne releases of radioactive materials following postulated accidents.
3. The NRC could perform an analysis of the consequences of a core-melt at the proposed Atlantic Generating Station for explicit consideration in the licensing process for that site.
4. The NRC could revise its regulations to require site-specific analysis of the consequences of Class 9 accidents as part of the site-licensing process.
5. The NRC could conduct a comprehensive risk analysis on floating nuclear powerplants comparable to *WASH-1400*, as has been suggested both in *WASH-1400* itself<sup>8</sup> and in the Environmental Protection Agency's critique of that study.<sup>9</sup>
6. In order to place the risks of floating nuclear plants in broader perspective, Congress could fund comparable studies of the risks of alternative sources of electric power, such as coal.

## Deployment in Volume

As many as 59 floating nuclear powerplants could be built by a single manufacturer by the year 2000 but no policy analysis of the impacts of deploying that many plants in U.S. coastal waters has been done or is contemplated.



Floating Nuclear  
Powerplants

### FINDINGS

1. Federal licensing of floating nuclear plants is confined to rather narrow technical and administrative questions related to building eight plants and deploying two of those plants off the New Jersey coast.

2. The one U.S. company now developing a capacity to build floating nuclear plants intends to build and market four such plants a year after 1985. If other manufacturers were to enter the field, production could exceed four plants a year after licenses were granted.

### DISCUSSION OF THE ISSUE\*

Offshore Power Systems, which is building a Jacksonville, Fla., facility to manufacture floating nuclear powerplants, estimates that it will have the capacity to complete 19 plants by 1990. Operating at peak capacity of four plants per year, it could complete 59 plants by the year 2000.

The only proposals which the Nuclear Regulatory Commission has been asked to license so far are proposals to manufacture eight plants and to deploy two of those plants behind protective breakwaters off the New Jersey coast.

While the Nuclear Regulatory Commission has prepared impact statements for these proposed actions it understandably has not taken it upon itself to examine the broader policy question of setting in motion a system that could produce large numbers of plants by the end of the century.

### Public Participation Comments

The construction of offshore powerplants has not been undertaken until now, with fuel processing plants and disposal have not.

It is difficult to protect for them and further risk of nuclear accidents is a current concern. The nuclear industry wants to see a system that is developed and operated.

\*This brief discussion of the issue is taken from the full text of "The Proposal for a Floating Nuclear Powerplant in the Mid-Atlantic," chapter IV, particularly pages 207- 210.



If the floating plant concept were successful, other manufacturers might enter the field, not only in the United States but also abroad.

The long-range implications of setting in motion a total system for building, installing, and **operating** nuclear powerplants in ocean waters have not been addressed by the NRC or by any other public or private organization.

Among the policy questions that are raised by the possibility of volume production of floating nuclear powerplants are:

- To what extent should the Federal Government be involved in major private industry decisions to deploy new technologies such as floating nuclear plants which could be supplying almost 10 percent of the Nation's total electrical energy by 1990?
- To what extent should Federal action consider siting decisions for large offshore powerplants?
- To what extent should Federal or State planning address the need for floating nuclear plants including evaluation of local and regional risks and benefits?
- What would be the effect on coastal areas of accelerated industrialization that might result from more plentiful supplies of electrical energy generated by offshore powerplants?
- Conceivably, the Offshore Power Systems plant alone could build 59 floating powerplants by the year 2000. To what degree would coastal States become dependent on that form of offshore energy production, if that many plants were deployed?
- If design flaws manifested themselves only after coastal States had become dependent on offshore systems for power, how would prolonged shutdowns of offshore plants affect coastal economies and the organizations involved in producing and operating such systems?
- What would the economic and social costs of large numbers of floating powerplants be, compared with alternative sources of energy?

- . What are the environmental and public health consequences of operation of large numbers of floating nuclear plants?

Raising these questions does not mean that this study has prejudged the answers. It is probable, however, that these long-range policy questions are at least as important as the shorter term technical and administrative questions which are being analyzed now and that they should be addressed formally.

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### CONGRESSIONAL OPTIONS

Committees of Congress with jurisdictional authority could commission a study on the effects of large-scale deployment of floating nuclear powerplants in U.S. and foreign waters.

## Technical Uncertainties

Several technical aspects of the deployment, operation, and decommissioning of floating nuclear powerplants have not been analyzed thoroughly enough to permit judgments about the relative risks of the overall system.



**Floating Nuclear  
Powerplants**

### FINDINGS

1. Techniques for handling fuel and radioactive wastes from floating nuclear plants have not been planned in detail. A system for supplying floating plants that includes barges or other vessels and shore bases is technically feasible, but without a specific design the risks cannot be evaluated.

2. The Nuclear Regulatory Commission has not developed regulations for decommissioning large power reactors, and levels of radioactivity to be permitted in decommissioning plans are now determined on a case-by-case basis.

3. Two separate studies of decommissioning standards and practices for major power reactors are now underway—one sponsored by industry and the other by the Nuclear Regulatory Commission; however, neither study covers floating plants.

4. If past practices were followed, only one of four methods the Nuclear Regulatory Commission proposed for decommissioning floating nuclear plants appears to be workable. The one workable method of decommissioning seems to be dismantling highly radioactive materials with remotely controlled equipment before a retired plant is withdrawn from the breakwater. The NRC analysis did not take into account new information that indicates that radioactive materials in the reactor vessel will not decay to levels that permit disposal by conventional methods for 110 years after a plant ceases operation.

### Public Participation Comments

"Nuclear power would make us less dependent on oil, but radioactive waste is a nearly prohibitive problem which should be dealt with before any further nuclear industry development."

"It is paradoxical that the United States faces a massive energy shortage for home buildings and factory space heating, while nuclear powerplants face problems disposing of waste heat."

"Construction of floating nuclear powerplants should be banned until a technology for complete fuel reprocessing and storage of radioactive wastes is more fully developed. Also, adequacy of emergency core cooling system must be demonstrated before additional nuclear powerplants are built."

## DISCUSSION OF THE ISSUE\*

Fuel and waste handling technology has not been fully developed for floating nuclear plants although existing techniques at land-based plants would apply to much of the system for floating plants. This includes standards for shipping containers, fuel storage and handling within the plants, and waste disposal. There are no obvious problems associated with fuel and waste handling which could not be adequately dealt with by properly engineered systems and there are no significant differences between floating and land-based plants as to the expected annual releases of liquid, solid, and gaseous radioactive waste. The draft environmental impact statement for the Atlantic Generating Station describes, in general terms, the most likely pattern for the fuel and waste handling system to be employed. As with land-based plants, major emphasis is placed on packaging of radioactive materials. Logical statements are made as to expected safety of handling and shipping operations but there is insufficient information to substantiate assigning a low risk to the operation. Analysis is needed on the detailed design of handling gear aboard the plant, design of equipment for ship-to-ship and ship-to-shore transfer, the design of a ship or tug-barge system to transport fuel and wastes, and the extent of the shore-side facility to receive and transfer fuel and waste.<sup>1</sup>

Decommissioning plans for floating nuclear plants have not been detailed and some of the options for decommissioning the Atlantic Generating Station, as stated in the environmental impact statement, have been proposed without thorough analysis of the expected inventory of radioactive materials after 40 years of plant operation. Decommissioning practices and the ultimate disposal of radioactive materials that are left after a large powerplant is shut down are questions which apply to all nuclear power reactors, and the problem is now being addressed, principally for land-based plants.

The NRC has issued a regulatory guide for decommissioning in general, but to date standards for future licensing of shut-down facilities are determined on a case-by-case basis. The Atomic Industrial Forum has sponsored a study of decommissioning land-based

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\*This brief discussion of the issue is taken from the full text of "The Proposal for a Floating Nuclear Powerplant in the Mid-Atlantic," chapter IV, particularly pages 213-222, 224-230.

nuclear plants which is due to be released in the fall of 1976. A similar study was initiated by the Nuclear Regulatory Commission for land-based plants during mid-1976. It is anticipated that results of both studies will be used by NRC to reevaluate standards for, and practices of, decommissioning large power reactors and disposing of radioactive materials.

OTA sponsored a short study of the differences between land-based and floating nuclear plants when evaluating decommissioning alternatives and determined that, based on past practice, only the option of dismantling the plant on site is clearly workable. Other options of sinking the activated plant, mothballing at another site, or mothballing followed by dismantling, which were described in the EIS, do not appear workable without clearer standards and further analysis of the techniques and the consequences. The OTA study also disclosed errors due to inadequate analysis in past investigations of decommissioning the FNP. It appears that the questions raised by OTA's decommissioning investigation could be addressed by analysis of public health standards for decommissioned plants, options available to meet those standards, and other effects of certain options such as sinking the plant in the ocean. The question of what shore facilities and support would be required for various approaches could also be addressed.

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## CONGRESSIONAL OPTIONS

1. Committees of Congress with jurisdictional authority could examine these uncertainties in oversight hearings. Some specific options which could be explored in hearings include:

a. A requirement that design criteria and procedures for transferring materials to and from floating plants be completed in detail before an operating license can be issued.

b. A requirement that disposal areas for spent fuel be assured in the event that a complete system for waste disposal and fuel reprocessing still has not been designed by the time the Atlantic Generating Station begins operating.

c. A requirement that the Nuclear Regulatory

**Commission reevaluate its conclusions and regulations on decommissioning for both floating and land-based nuclear plants.**

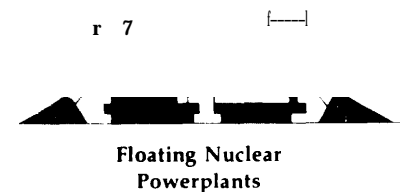
**2. Committees of Congress with jurisdictional authority could ask the NRC to estimate the time and resources required to resolve technical and administrative uncertainties, and to solicit independent judgments about whether the problems are serious enough to warrant such time and resources.**

#### **OTHER OPTIONS**

The Nuclear Regulatory Commission, acting on its own authority, could initiate studies designed to resolve the technical and administrative uncertainties.

## Siting of Floating Powerplants Outside U.S. Territorial Limits

Because there is no physical barrier to locating floating nuclear powerplants more than 3 miles offshore, proposals for siting plants outside territorial limits are possible. However, U.S. authority to regulate floating nuclear powerplants outside U.S. territory is not clear under existing international law.



### FINDINGS

1. State laws which would otherwise apply to nuclear powerplants would not cover any portion of a facility sited outside a State's territorial waters.

2. The Nuclear Regulatory Commission appears to be unable to approve the installation of a U.S. nuclear powerplant in waters outside U.S. borders, but on the Continental Shelf.

3. The Outer Continental Shelf Lands Act applies only to the exploration and exploitation of natural resources and not to the construction of a breakwater, positioning of cables, and other activities associated with a nuclear power station.

4. Existing international law does not specifically settle the question of jurisdiction over a floating nuclear powerplant located beyond national territorial limits, and if the Third U.N. Law of the Sea Conference should fail to settle the matter, the question of jurisdiction will be left to the unilateral action of nations.

### DISCUSSION OF THE ISSUE\*

An offshore nuclear power station has been proposed for location within 3 miles of the New Jersey coastline. The Atlantic Generating Station consists of a pair of floating nuclear plants moored within a large breakwater. Since waters shallow enough to accommodate this type of facility (maximum 70 feet) can be found

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\*This brief discussion of the issue is taken from the full text of "The Proposal for a Floating Nuclear Powerplant in the Mid-Atlantic," chapter IV, particularly pages 207-210.

more than 3 miles from shore, proposals for more distant locations could be made. Furthermore, there may be technical, social, economic, environmental, or other advantages to siting a floating nuclear powerplant outside the 3-mile limit.

United States domestic law presently appears to prohibit the licensing of a nuclear powerplant in any location "not under or within the jurisdiction of the United States." (There are certain exceptions, but they are not relevant here.) Because legal authority extending U.S. jurisdiction for such purposes is lacking, it is questionable whether NRC would have the authority to issue a license for a nuclear power station moored in waters beyond the territorial sea. Legislation to clarify this situation would be necessary.

Moreover, the legal authority of the United States to extend its jurisdiction to water areas over its Continental Shelf, but beyond 3 miles, is uncertain under existing international law. Comprehensive U.S. sovereignty ends at 3 miles. Certain special purpose authority, e.g., on the Continental Shelf for exploration and exploitation of natural resources, is sanctioned by international law', but jurisdiction to authorize the construction or operation of floating nuclear powerplants is not presently recognized.

Thus, clarification of U.S. authority under international law to regulate this activity beyond its territorial limits is an important precedent to an extension of jurisdiction, if conflict with other nations is to be avoided. Treaty articles are now being debated in the Third U.N. Law of the Sea Conference, which may settle the international law question.

## DOMESTIC LAW

### 1. State Jurisdiction

The regulatory jurisdiction of most States is limited to waters within the 3-mile limit. State laws which would otherwise apply to nuclear powerplants would not cover a facility sited beyond 3 miles. The State would have jurisdiction over transmission lines within State waters but it would have no control over such matters as environmental protection. In short, a State would have very little control over the nuclear facility located at 3.1 miles as opposed to the same facility located at 2.9 miles. Such a



situation certainly would dampen a State's desire for involvement in an extra-territorial nuclear project.

## 2. Federal Law

Section 101 of the Atomic Energy Act (42 USC 2131) reads as follows:

It shall be unlawful except as provided in section 91 of this Act for any person within the United States to transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use, import, or export any utilization or production facility, except in accordance with a license issued by the Commission pursuant to section 103 or 104 of this Act.

And section 103 provides in part:

(d) No [commercial] license under this section may be given to any person for activities which are not under or within the jurisdiction of the United States. . . .

These provisions can be read to prohibit the awarding of a license by the Nuclear Regulatory Commission (NRC) for a floating nuclear powerplant to be sited outside U.S. territorial limits. The waters on the U.S. Continental Shelf beyond 3 miles are not clearly "under or within U.S. jurisdiction." This being so, the NRC would be unable to approve the installation of a U.S. nuclear powerplant in waters outside U.S. borders but on the Continental Shelf.

NRC officials believe they have jurisdiction beyond 3 miles under existing law, but no written opinion has been rendered by the Commission.

The Outer Continental Shelf Lands Act creates a regulatory regime and a system for leasing land applicable only to the exploration and exploitation of natural resources (e.g., oil, gas, and sulphur). That law is not applicable to the construction of a breakwater, positioning of cables, etc., associated with a nuclear power station. Lack of this kind of authority is a further hindrance to offshore nuclear power development beyond 3 miles.

Other Federal regulatory mechanisms, e.g., environmental controls, likewise are geographically limited. Without a clear extension of all such authorities in legislation, the construction of a floating nuclear

powerplant would either not be attempted or be refused by Federal officials.

# INTERNATIONAL LAW

If clarification of U.S. law is desired, a geographical extension of U.S. laws and regulations must have international support. Without a legal basis for its action, the United States could face protests from neighboring nations or from nations which use the high seas off U.S. coasts.

Existing international law of the sea does not specifically settle the question of jurisdiction over a floating nuclear powerplant located beyond national territorial limits. Existing law clearly affords a coastal nation the authority to prescribe regulatory measures for nuclear powerplants sited within its territorial waters. The limit of territorial waters is presently set at 3 miles by custom but quite likely will be expanded to 12 miles in the near future, either through custom or by treaty. Beyond territorial waters, ocean areas are essentially free from national control except for very limited purposes recognized in convention or custom (Convention on the High Seas, 1958). Authority exists by treaty, for example, to regulate for sanitary, customs, or fiscal purposes in a contiguous zone of 12 miles from shore (Convention on the Territorial Sea and Contiguous Zone, 1958).

Presently under negotiation, in the fifth session of the Third United Nations Law of the Sea Conference, are treaty provisions which will clarify jurisdiction over economic activities in coastal waters beyond territorial limits. The Conference's revised single negotiating text (RSNT), part 2, contains several provisions relevant to the consideration of jurisdiction over floating nuclear powerplants. Directly relevant is chapter 3 of the RSNT which would create an exclusive economic zone extending 200 nautical miles from the coastline. (See especially Articles 44, 45, and 48.) Article 44 specifies the rights, jurisdiction, and duties of the coastal States in the exclusive economic zone and reads in part as follows:

1. In an area beyond and adjacent to its territorial sea, described as the exclusive economic zone, the coastal State has:

X-

(b) Exclusive rights and jurisdiction with regard to establishment and use of all artificial islands, installations, and structures;

(c) Exclusive jurisdiction with regard to  
(i) other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents, and winds;

\* \* \* \* \*

These provisions, in essence, would provide the coastal State with the legal authority to regulate (and to authorize the location of) floating nuclear powerplants in this 200-mile economic zone. Consequently, the question of U.S. jurisdiction over floating nuclear powerplants constructed beyond 3 miles, but within 200 miles offshore may very well be settled by agreement in a new law of the sea treaty. However, there are many who believe that this Conference will fail and no agreement will be reached. In that event, settlement of the question of jurisdiction will be handled in the traditional customary law fashion, whereby nations will unilaterally claim jurisdiction, or the right to regulate and locate such facilities off their shores. Such claim will then be either accepted or rejected by other countries.

In summary, international law in this area is in a developing phase, but it may be clarified in the near future.

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## CONGRESSIONAL OPTIONS

In light of the ambiguity of the legal regime applicable to floating nuclear plants outside U.S. territorial waters, the Congress may wish to consider action which would:

1. Clearly establish a U.S. claim of extended jurisdiction in coastal waters for purposes of regulating power-production facilities such as offshore nuclear plants.
2. Extend seaward existing Federal laws governing such matters as the placement of structures offshore, the disposal of dredged materials and pollutants, and enforcement and monitoring

thereof. Alternatively, the Congress may wish to enact new legislation setting up a separate administrative structure for licensing of offshore power-production facilities.

3. Establish a process by which lands under the waters of the contiguous zone could be leased for purposes other than resource exploration and exploitation.
4. Extend adjacent State laws to such facilities.

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## Footnotes: Chapter III

### ISSUE 1 OFFSHORE PRIORITIES AND PLANNING

1. Data based on conversation with National Fisheries Service, May 3, 1976, and William F. Gusey, "The Fish and Wildlife Resources of the Middle Atlantic Bight," January 1976.
2. Ibid.
3. Port Authority of New York and New Jersey, *Port of New York Statistics*, 1974, and *Philadelphia Maritime Exchange Statistics*, 1958-74.
4. Working Paper #2.

### ISSUE 2 FEDERAL MANAGEMENT SYSTEM

1. Interviews with Interior staff members, February 1976.
2. During a February 17, 1976, interview with Office of Coastal Zone Management staff members, OTA researchers were told by one official: "It is not clear who is doing what, and the States are bewildered. No one even knows for sure who is going to do what. It is a very confused process."
3. "The Federal Government doesn't seem to understand why we are being so dogmatic about some things," a Delaware official told an OTA researcher on February 4, 1976. "We have to be because they are so sloppy."

### ISSUE 3 REGULATION AND ENFORCEMENT

1. Working Paper #1.
2. Ibid.
3. Ibid.
4. According to U.S. Coast Guard Pollution Incident Reporting System (PIRS) data on oil spills in 1974, a major source of discharge was pipelines.

### ISSUE 4 OIL SPILL LIABILITY AND COMPENSATION

1. Written responses to an OTA questionnaire distributed August 1975-January 1976, and oral statements in OTA workshops in May, June, and August, 1975.
2. Martin C. Miller, Jerry C. Bacon, Ivan M. Lissauer, Office of Research and Development, U. S. Coast Guard, Department of Transportation, *A Computer Simulation Technique for Oil Spills off the New Jersey*

*Delaware Coastline*, Report No. CG-D-1 /1975, Springfield: National Technical Information Service, September 1975.

3. Interagency Comprehensive Oil Spill Liability Group, Department of Justice Draft Memorandum, March 14, 1975, p.5.
4. Ibid.
5. Section 4(a) (2) of the Outer Continental Shelf Lands Act, as amended by the Deep-water Port Act.
6. Interviews with State officials, June 1976.
7. Environmental Policy Institute, *Oil: Study of Pollution Insurance Liability Laws*, October 10, 1975.
8. Ibid, pp. S-5 and 6, and op. cit., Interagency, pp. 26-27.
9. Ibid.
10. Bergman, Samuel, "No Fault Liability for Oil Pollution Damage," *Journal of Maritime Law and Commerce*, vol. 5, October 1973, pp. 20-21.
11. Lundquist, Thomas R., "Compensation for Oil Pollution Damages," *The Institute on Man and Sciences, Symposium*, February 1974, and op. cit., Interagency, pp. 15-18.
12. For discussion of the current status of court decisions on these matters, see Interagency Study Group, March 15, 1975, pp. 14-16.
13. Maine, Massachusetts, Washington, Oregon.
14. Environmental Policy Center testimony on New Jersey, S. 1409, June 2, 1976.

### ISSUE 5 OIL SPILL CONTAINMENT AND CLEANUP

1. Working Paper #3.

### ISSUE 6 ENVIRONMENTAL STUDIES

1. Working Paper #10.
2. U.S. Department of the Interior, *Draft Environmental Impact Statement for Mid-Atlantic Sale #40*, Vol. 2, p. 359.
3. Straughan, Dale M., *Environmental Studies as They Relate to Offshore Petroleum Operations*, Report to the Marine Board, National Research Council, 1975.

### ISSUE 7 STATE ROLE

1. Working Paper #1.

#### ISSUE 8 POLLUTION RESEARCH

1. Working Paper #3.
2. Gulf Universities Research Consortium (1974), "Final Project Planning Council Consensus Report," *Offshore Ecology Investigation*, Report #138, September 20, 1974.
3. American Petroleum Institute, Proceedings, 1975 Conference on Prevention and Control of Oil Pollution, March, 1975.
4. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, "Report to the Congress on Ocean Pollution, Overfishing and Offshore Development," January 1975.

#### ISSUE 9 CONFLICTING OCEAN USES

1. U.S. Department of Transportation, U.S. Coast Guard Investigating Officer's Report on the MV Globtik Sun collision with Chevron Oil Co. unmanned structure 175-2, December 1, 1975.
2. Op. cit., U.S. Department of the Interior, *Draft Environmental Impact Statement*.
3. Report by Subcommittee on Safety of Navigation of the International Maritime Consultative Organization, August 2, 1975.
4. Comments on Leasing the OCS Mid-Atlantic by the Atlantic Offshore Fish and Lobster Association, May, 1975.
5. Ibid.

#### ISSUE 10 TANKER DESIGN AND OPERATIONS

1. U.S. Congress, Office of Technology Assessment, *Oil Transportation by Tankers: An Analysis of Marine Pollution and Safety Measures*, Washington: Government Printing Office, 1975.
2. U.S. Senate Commerce Committee hearings on Ports and Waterways Safety Act of 1972, March 2 and 3, 1976. "
3. Op. cit., Office of Technology Assessment.
4. *Federal Register*, vol. 41, No. 94, May 13, 1976.

#### ISSUE 11 OIL SPILL CONTAINMENT AND CLEANUP AT DEEP WATER PORTS

1. 33 CFR 149.319.
2. Interview with officials of U.S. Department of Transportation, U.S. Coast Guard.
3. U.S. Congress, Office of Technology

Assessment, *Oil Transportation by Tankers: An Analysis of Marine Pollution and Safety Measures*, Washington: Government Printing Office, 1975.

#### ISSUE 12 STANDARDS IN STATE WATERS

1. Working Paper #1.
2. Ibid.

#### ISSUE 13 ADJACENT COASTAL STATE STATUS

1. Interview with Hal Scott, Florida Audubon Society, April 6, 1976.
2. Correspondence from U.S. Department of Commerce, National Oceanic and Atmospheric Administration, to William T. Coleman, Secretary of Transportation, March 11, 1976.
3. Correspondence from U.S. Department of Transportation, U.S. Coast Guard, to William T. Coleman, Secretary of Transportation, March 17, 1976.
4. Interview with DOT officials, April 5, 1976.
5. Ibid.

#### ISSUE 14 RISKS FROM MAJOR ACCIDENTS

1. Working Paper #8.
2. U.S. Nuclear Regulatory Commission, *Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants*. WASH-1400, NUREG-75/014, Washington, D.C., October 1975. This study, performed by a group of about 50 specialists under the Direction of Professor Norman Rasmussen of MIT, is commonly known as the Rasmussen Report. This report dealt only with land-based nuclear plants.
3. The ice condenser pressure suppression system used on the floating plant is the primary reason for this difference; similar systems are being used in new land-based plants as well.
4. U.S. Atomic Energy Commission, Interim General Statement of Policy "Protection Against Accidents in Nuclear Power Reactors," *Federal Register*, Vol. 3, No. 167, Tuesday, August 27, 1974, p. 30964.
5. Ibid, p. 30965.
6. Op. cit., U.S. Nuclear Regulatory Commission. See following table:

**Table III-1.** Consequences of individual release categories

TYPE	ACCIDENT PROBABILITY PER YEAR	AVERAGE*		Damage (\$X109)	Man-rem (X10 <sup>6</sup> )	PEAK* .	
		Man-rem (X10 <sup>6</sup> )	Acute Fatalities			Acute Fatalities	Damage (\$X109)
PWR 1	7X1 0-7	2.8	34	1.4	32	1,100	4.3
PWR 2	5X1 0-6	3.1	62	1.8	31	2,300	5.6
PWR 3	5X1 0-6	1.4	39	.70	13	1,100	2.6
PWR 4	5X1 0-7	.29	2.7	.24	2.9	106	1.6
PWR 5	1 X1 0-6	.07	.22	.06	.70	17	.46
PWR 6	1 X1 0-5	7.5X1 0-3	o	1.0X10-3	91 X10-3	o	4.9X10 <sup>-3</sup>
PWR7	6x1 0 <sup>-5</sup>	1.3X10-4	o	1.1X10 <sup>-5</sup>	16x10 <sup>-4</sup>	o	3.6x10 <sup>-5</sup>
PWR8	4X10-5	.92x10 <sup>-3</sup>	o	.43X10 <sup>-3</sup>	15X10 <sup>-3</sup>	o	2.2X10 <sup>-3</sup>
PWR9	4X10-4	1.1X10-6	o	* O	19X10 <sup>-6</sup>	o	= 0
BWR1	9X10 <sup>-7</sup>	2.2	1.7	1.2	21	115	4.4
BWR2	2X10-6	1.8	48	1.2	16	1,200	4.0
BWR3	1X10-5	.89	3.0	.61	9.4	110	3.4
BWR4	3X10-5	.42	3.9	.28	4.2	90	1.5
BWR5	1X10-5	.19	1.1	.10	1.8	52	.86
BWR6	1X10-4	.22X10-6	o	= 0	3.5X10 <sup>-6</sup>	o	- 0

\*Average over population and meteorological conditions, assuming accident occurs with unit probability, i.e., given the accident.  
 •It should be understood that the probabilities of these peak values are approximately three orders of magnitude smaller than the accident probability values given in column 2.

NOTE: The conclusion that the risks from Class 9 accidents are greater than the risks from Class 8 accidents is implied in the table 111-1, which was included in the draft of the Reactor Safety Study (page 71, Appendix VI), but not in the final report.

The rows labeled PWR 1 through PWR 9 represent sets of accident sequences in pressurized water reactors that produce each of nine distinct categories of releases of radioactive materials from the containment. The probability given for each release category is the sum of the probabilities of the various accidents that could produce that type of release. Category PWR 9 approximates a Class 8 design-basis, loss-of-coolant accident, in which the safety systems function properly and no core-melt occurs. Categories PWR 1 through PWR 7 all result from Class 9 core-melt accidents involving some failure of the emergency systems and ultimately failure of the containment and escape of radioactive materials.

The relatively greater risks of Class 9 accidents can be seen by comparing the most severe category of core-melt accidents, PWR 2, with the Class 8 category, PWR 9. The table shows that PWR 2 is on the order of about 80 times less likely than PWR 9, yet the consequences are many orders of magnitude greater. For example, the expected total radiation dose to humans—the primary determinant of long-term cancer deaths—is nearly 2 million times

greater for PWR 2 than for PWR 9 (3.1 million man-reins compared to 1.1 man-reins). In terms of early deaths, PWR 2 would produce on the average 62 deaths and could cause up to a peak of 2,300 deaths, while PWR 9 is not expected to cause early deaths even under the worst weather and site conditions. In economic terms, PWR 2 would produce on the average \$1.8 billion in damages, while PWR 9 would produce essentially negligible economic impacts even in the worst circumstances.

7. Yellin, Joel, "The Nuclear Regulatory Commission's Reactor Safety Study, WASH-1400," *The Bell Journal of Economics*, vol. 7, No. 1, Spring 1972, Table 2, p. 325.
8. Op. cit., U.S. Nuclear Regulatory Commission.
9. U.S. Environmental Protection Agency, *Reactor Safety Study*, WASH-1400: A Review of the Final Report, June, 1976, pp. 1-8.

#### ISSUE 16 TECHNICAL UNCERTAINTIES

1. Working Paper #9.
2. Ibid.

