

GAO

United States General Accounting Office ¹²⁹⁵⁸⁴
Report to Congressional Requestors

December 1985

OFFSHORE OIL AND GAS

Inspection of Outer Continental Shelf Facilities



129584

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GAO/RCED-86-5

534193/ 129 584

Resources, Community, and
Economic Development Division

B-220739

December 31, 1985

The Honorable John D. Dingell
Chairman, Subcommittee on
Oversight and Investigations
Committee on Energy and Commerce
House of Representatives

The Honorable Mike Synar
Chairman, Subcommittee on Environment,
Energy, and Natural Resources
Committee on Government Operations
House of Representatives

This report responds to your separate requests that we look at the federal government's programs to ensure safe and environmentally sound offshore operations. Although a number of agencies oversee offshore oil and gas operations, the Department of the Interior and the U.S. Coast Guard are primarily responsible for inspecting offshore facilities. We found that both agencies are generally meeting their inspection requirements although the Coast Guard, because it did not have enough helicopter transport, did not inspect all facilities as required. The report also discusses the actions being taken by Interior to improve its program management. At your request, we did not obtain agency comments on a draft of this report.

Unless this report is publicly announced by either of you, we plan no further distribution until 30 days from the date of the report. At that time, copies will be sent to the Director, Office of Management and Budget; the Secretary of the Interior; the Commandant, U.S. Coast Guard; other House and Senate committees and subcommittees having oversight and appropriation responsibilities for the offshore leasing and development program; and other interested parties.



J. Dexter Peach
Director

Executive Summary

In 1982 Interior implemented an area-wide program for leasing offshore oil and gas, which has resulted in significantly more land being leased and explored. Since the first area-wide lease sale in April 1983, over 14 million acres have been leased, as compared to 24 million acres leased in the previous 29 years of the offshore leasing program. The Congress, while encouraging expedited exploration and production through the Outer Continental Shelf Lands Act, as amended, also required that such activities be conducted in a safe and environmentally sound manner. Accordingly, the amendments established certain inspection requirements for offshore facilities.

In response to congressional requests, GAO obtained information on

- the scope of federal inspection responsibilities for offshore oil and gas activities,
- the nature and timeliness of the government's offshore safety and environmental inspections, and
- the extent and timeliness of follow-up efforts.

Background

Although several federal agencies oversee offshore oil and gas operations, primarily Interior's Minerals Management Service (MMS) and the U.S. Coast Guard conduct inspections. Both agencies are required to perform inspections—annual scheduled and periodic unannounced—of all offshore facilities subject to safety and environmental regulations. The 1978 amendments also authorize MMS to assess civil penalties of up to \$10,000 per day for safety or environmental violations.

Although exploratory drilling has occurred in all four MMS regions—Alaska, Atlantic, Gulf of Mexico, and Pacific—only the Gulf and Pacific regions have wells producing oil or natural gas. MMS regulates all Outer Continental Shelf (OCS) exploration, drilling, and production operations and thus inspects all drilling and production facilities, generally for safety of equipment and operations. The Coast Guard is generally responsible for regulating worker and maritime safety. As such, it inspects the same OCS facilities for worker safety and inspects and certifies all mobile (i.e., floating or oceangoing) offshore drilling facilities for seaworthiness.

Results in Brief

During fiscal year 1983 MMS generally met its requirement to conduct scheduled annual inspections of OCS facilities; however, the Coast Guard

did not. Further, MMS performed some periodic unannounced inspections.

MMS and the Coast Guard found few violations per facility. Although reinspection of a facility would provide added assurance that violations had been corrected, both agencies usually did not perform separate reinspections of production facilities. Drilling facilities, however, are more prone to accidents and were generally reinspected.

MMS inspection frequency and scope varied because of differing regional inspection strategies and staffing. According to its officials, the Coast Guard did not inspect all production facilities because it did not have enough resources, particularly helicopter transportation.

GAO Analysis

MMS Inspections

During fiscal year 1983 MMS inspected 94 percent of the OCS drilling and 96 percent of the OCS production facilities. The Pacific MMS region routinely conducted periodic unannounced inspections. The three other regions did not conduct routine unannounced inspections because of reliance upon availability of key company personnel to shut down equipment for inspection, reliance on company transport to sites, or the full-time presence of inspectors on board remote facilities.

The Gulf of Mexico region cited about 3 times the number of violations per production inspection as the Pacific region and 10 times more drilling violations per inspection. According to MMS officials these differences were due to the other region's more frequent inspections and, thus, more "presence" on facilities. (See p. 42.)

In turn, differences in the frequency of inspections—38.4 per production facility in the Pacific region versus 1.4 in the Gulf region—were due to differences in the relative workload and resources. MMS headquarters officials told us that both local public opinion about offshore development and regional inspection strategies also affected the frequency of inspections. For example, in 1983 there were 25 inspectors for the 2,551 Gulf production facilities (1 inspector for every 102 facilities). By contrast, the Pacific region had 5 inspectors for only 19 production facilities (1 inspector for every 4 facilities). (See pp. 22 and 23.)

MMS Gulf of Mexico officials said that, in their judgment, MMS' inspection frequency is adequate as evidenced by the small number of OCS accidents.

MMS has recently restructured its offshore inspection program to better define program goals, reduce autonomous regional philosophies, more consistently apply inspection policies and procedures, and provide more uniform inspection data. GAO believes MMS' actions will provide a more uniform and improved inspection program.

Violations Cited by MMS

MMS conducted 4,321 production inspections and 3,158 drilling inspections in fiscal year 1983. It found about 1.2 violations per production inspection, ranging from faulty valves for monitoring oil and gas pressure to improper record maintenance. Drilling facilities received relatively fewer violations—0.16 per inspection—including violations for improper design, maintenance, and testing of equipment and improper materials discharge. For over 70 percent of the Gulf of Mexico production violations, MMS temporarily shut down part of the facility, whereas only 1 percent of the Pacific violations resulted in a shutdown. For drilling facilities, 45 percent of the Gulf violations and 19 percent of the Pacific violations resulted in part of the facility being shut down. An MMS official told GAO that the Gulf region shuts down more facilities than the Pacific region because the equipment has been in service longer and tends to fail more often. (See pp. 42-49.)

Coast Guard Inspections

The Coast Guard inspected 69 percent of the production facilities and 96 percent of the mobile offshore drilling units, as required during fiscal year 1983. It cited 1.1 violations per production inspection and 2.8 violations per drilling inspection with violations mainly involving missing or inoperable lifesaving or other equipment. According to Coast Guard officials, it did not have enough resources in the Gulf, especially helicopter transport, to inspect all facilities and therefore had to give highest priority to inspecting mobile offshore drilling units (because they are more prone to accidents), second priority to manned production facilities, and lowest priority to unmanned production facilities. (See pp. 36-37 and 52.)

Violation Follow-Up and Penalties

When MMS and the Coast Guard did not witness violations being corrected or did not reinspect offshore facilities, they relied on the operator's notification that violations had been corrected. Operators cited for

violations generally responded within prescribed time frames that violations had been corrected. (See pp. 49 and 53-54.)

From January 1980 through December 1982, MMS instituted 54 civil penalty cases, resulting in about \$1.1 million in fines. However, in 1983 a federal court ruled that MMS had to allow operators a reasonable time to correct violations before assessing penalties. MMS changed its civil penalty procedures and has not assessed any civil penalties since 1983.

Recommendations

GAO is making no recommendations.

Agency Comments

GAO did not obtain written agency comments on this report; however, agency officials were briefed on the report's contents and their comments were incorporated where appropriate.

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Abbreviations

GAO	General Accounting Office
MMS	Minerals Management Service
MODU	mobile offshore drilling unit
NPDES	National Prevention Discharge Elimination System
OCS	Outer Continental Shelf
OSHA	Occupational Safety and Health Administration

Introduction

Since 1953 the federal government has managed the development of oil and gas resources of the Outer Continental Shelf (OCS). The area from approximately 3 to 200 miles offshore is under federal jurisdiction while the first 3 miles offshore belongs to the adjacent states.¹ In promoting development of OCS resources, the federal government also takes measures to minimize the risks of development and ensure the safety of offshore workers, the marine environment, and offshore installations. These measures, which emanate from national policy set forth in legislation, are aimed at minimizing potential life-threatening, injurious, and environmentally damaging effects of offshore oil and gas operations.

In 1973 we reported on the Department of the Interior's (Interior) efforts in regulating and inspecting federal offshore oil and gas operations.² We recommended that Interior more vigorously apply its enforcement regulations, establish a more realistic policy on inspection frequency on the basis of available resources, provide formal training for inspectors, and issue instructions covering partial inspections³ and well workover⁴ and abandonment operations. Subsequent to our report, Interior issued a new policy on inspection frequency. Instructions covering remedial or workover operations have been drafted but have not yet been finalized. A formal training program for inspections is still being planned.

Since our 1973 report, the rate of leasing and exploration has increased significantly. In 1982 Interior implemented an area-wide program for OCS leasing. Since the first area-wide lease sale in April 1983, over 14 million acres have been leased, as compared to 24 million acres leased in the previous 29 years of the offshore leasing program.

Drilling and production facilities are used in offshore operations to explore for and produce oil and natural gas. Generally, one of three types of facilities is used to support offshore well drilling—"jack-up rig," "semi-submersible," or "drillship." Jack-up rigs are towed to a drillsite, their steel legs are lowered to the ocean floor, and the drilling

¹Two special cases are Texas and the Gulf Coast of Florida where the first 9 miles offshore are under state jurisdiction.

²Improved Inspection and Regulation Could Reduce the Possibility of Oil Spills on the Outer Continental Shelf (June 29, 1973, B-146333).

³Partial inspection refers to inspection of some, but not all, regulated operations occurring on an offshore oil or gas facility.

⁴Workovers are operations on a producing well to restore or increase its production. During workover the well's inner piping is removed, and the casing at the bottom of the well is cleaned.

platform is jacked up on the legs to a safe height above the waves. Semi-submersibles are towed or propelled to the drillsite and stabilized in the water by partially flooding their hollow pontoons. Drillships, usually used in deeper waters, are self-propelled ships that are moored to the ocean floor or dynamically positioned over the drillsite. If exploratory drilling is successful, fixed production facilities are placed on the drillsite. These can be single-well units or large platforms capable of handling 30 or more wells. It is from the production facilities that oil and/or natural gas is actually extracted from beneath the ocean floor. Additional wells can also be drilled from production platforms. Interior inspectors inspect both drilling and production facilities.

Legislative Provisions

The Outer Continental Shelf Lands Act (67 Stat. 462), as amended, is the primary legislation governing federal offshore oil and gas operations. Under the act Interior and the U.S. Coast Guard are responsible for promulgating and enforcing safety and environmental regulations dealing with offshore operations and workplace activities. The 1978 amendments to the act require scheduled on-site inspections, at least once annually, of each OCS facility that is subject to environmental or safety regulations and periodic on-site inspections without advance notice.

The Congress, while encouraging expedited exploration and production through the 1978 amendments, bolstered Interior's inspection and enforcement authority by establishing a civil and criminal penalties program for violations of OCS regulations. Under its enforcement program, Interior can assess civil penalties of up to \$10,000 a day for each violation.

Other relevant legislation affecting OCS safety and environmental issues are the Federal Water Pollution Control Act Amendments of 1972; the Rivers and Harbors Appropriations Act of 1899, as amended; the Ports and Waterways Safety Act of 1972; the Occupational Safety and Health Act of 1970; and the Natural Gas Pipeline Safety Act of 1968. Under the Federal Water Pollution Control Act Amendments, OCS activities are subject to effluent standards and ocean discharge criteria developed by the Environmental Protection Agency. Under the Rivers and Harbors Act, the Department of the Army issues permits for the construction of any structure in or over navigable U.S. waters. The Ports and Waterways Safety Act of 1972 gave the Coast Guard authority to establish, operate, and maintain shipping and routing systems although the Department of the Army retained most of this responsibility under the Rivers and Harbors Act. The Occupational Safety and Health Act of 1970 gives the

Occupational Safety and Health Administration (OSHA) authority to make rules for occupational safety and health on the OCS. The Natural Gas Pipeline Safety Act gives the Department of Transportation jurisdiction over gathering and transmission pipelines. In addition, the Longshoreman's and Harbor Worker's Compensation Act (33 U.S.C. 901, et seq.) relates to disability or death of an employee resulting from operations conducted on the OCS.

Agencies Involved

Although several federal agencies are involved in overseeing offshore oil and gas operations, the primary agencies that conduct safety and environmental inspections are Interior's Minerals Management Service (MMS) and the Coast Guard.

Minerals Management Service

Since 1982 MMS⁶ has regulated all mineral exploration, drilling, and production operations on the OCS. Inspectors usually travel to offshore facilities by helicopter, although in some instances they travel by boat. On board the facility, MMS inspectors observe, check, and determine regulatory compliance for matters as routine as the existence of a proper identification sign affixed to the facility and as complex as the existence and proper operation of the multitude of pressure relief, shutdown, surface, and below-surface safety valves required to prevent well blowouts.

MMS has both drilling and production inspectors. Although some common processes exist, there are many differences between finding oil and natural gas and producing them. Accordingly, MMS inspectors inspect different equipment and conditions on drilling and production facilities. For example, during drilling inspections, MMS inspectors determine regulatory compliance with OCS orders and regulations in such areas as well structures, drilling mud processes, and drilling safety equipment and procedures. For production inspections, MMS inspectors determine compliance with OCS orders and regulations in areas such as welding operations, fire and gas sensors, compressors, pipelines and pipeline pumps, and monthly checks by the operator of safety devices. When violations of regulations are cited by an inspector, depending on the severity of the violation, the inspector may issue a simple warning or close down part or all of an entire facility.

⁶On January 19, 1982, the Secretary of the Interior established the Minerals Management Service (MMS). At that time, the Conservation Division of the U.S. Geological Survey was abolished and all its functions transferred to MMS.

Coast Guard

Although MMS has primary responsibility for inspecting technical off-shore oil and gas facilities, the 1978 amendments to the OCS Lands Act require the U.S. Coast Guard to promulgate and enforce regulations for the safety of life and property on OCS facilities and vessels. The Coast Guard conducts inspections to determine the existence and adequacy of lifesaving and fire-fighting equipment and that personnel have received appropriate lifesaving training. The act requires the Coast Guard, like MMS, to conduct scheduled annual inspections and periodic unannounced inspections of OCS facilities. The Coast Guard also inspects and certifies the seaworthiness of mobile offshore drilling units,⁶ issues licenses for certain marine personnel, and supervises cleanup of oil and other hazardous discharges.

Other Agencies

OSHA, within the Department of Labor, has authority to establish rules for occupational safety and health on the OCS. Under an agreement between OSHA and the Coast Guard, the Coast Guard, as well as OSHA, promulgates safety and health regulations on the OCS. However, OSHA coordinates with the Coast Guard in an effort to minimize OSHA inspections of OCS activities.

Under the Natural Gas Pipeline Safety Act of 1968, the Department of Transportation's Office of Pipeline Safety Regulation exercises jurisdiction over the gathering and transmission pipelines associated with OCS facilities.

The Environmental Protection Agency's major OCS responsibility is the issuing of National Pollution Discharge Elimination System (NPDES) permits. NPDES permits for oil and gas facilities provide effluent limitations developed pursuant to Section 403 of the Federal Water Pollution Control Act Amendments of 1972.

The U.S. Army Corps of Engineers is responsible for approving the construction of any structure on the OCS, including artificial islands and fixed structures used in oil and gas operations. The Department of the Army also has established shipping fairways and anchorages on the OCS to provide safe passage of vessels through areas of mineral exploration and development.

⁶A self-contained offshore drilling facility—such as a jack-up rig, semi-submersible, or drill ship—capable of being towed or having means for self-propulsion.

Objectives, Scope, and Methodology

This report responds to requests from the Chairman, Subcommittee on Environment, Energy, and Natural Resources, House Committee on Government Operations, and the Chairman, Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, to review the federal government's efforts to ensure safe and environmentally sound offshore oil and gas operations. We were asked to obtain information on the (1) scope of federal inspection responsibilities for offshore oil and gas activities, (2) nature and timeliness of the government's offshore safety and environmental inspection program, (3) extent and timeliness of follow-up efforts for inspection violations, (4) adequacy of regulations providing penalties for offshore safety and environmental infractions, and (5) adequacy of existing resources, including staffing levels, dedicated to inspection activities.

We interviewed agency officials, reviewed agency files and documents, and obtained data concerning agencies' roles and responsibilities, inspection and enforcement programs, and resources relative to the safe and environmentally sound operation of offshore oil and gas facilities. Since our review addressed the broad scope of federal oversight of offshore safety and environmental regulation, it involved several agencies and locations listed in table 1.1.

Table 1.1: Agencies Visited and Their Locations

Agency/Office	City
The Minerals Management Service	
Headquarters	Washington, D.C.
	Reston, Va.
Regional Offices	Metairie, La.
	Los Angeles, Calif.
	Anchorage, Alaska
	Vienna, Va.
District Offices	Metairie, La.
	Lake Charles, La.
	Lafayette, La.
	Houma, La.
	Freeport, Tex.
	Ventura, Calif.
U.S. Coast Guard	
Headquarters	Washington, D.C.
District Offices	
8th	New Orleans, La.
11th	Long Beach, Calif.
17th	Anchorage, Alaska
Marine Safety Offices	New Orleans, La.
	Port Arthur, Tex.
	Galveston, Tex.
	Corpus Christi, Tex.
	Long Beach, Calif.
	Santa Barbara, Calif.
The Environmental Protection Agency	
Headquarters	Washington, D.C.
Regional Offices	Dallas, Tex.
	San Francisco, Calif.
The Occupational Health and Safety Administration	
Administration	Washington, D.C.
U.S. Army Corps of Engineers	
	Washington, D.C.

In order to gain an historical perspective of the level of inspection effort by Interior and the Coast Guard, we attempted to obtain inspection and resource trend data for fiscal year 1970 through the most current period. Because of differences in the availability of certain information and inconsistencies in data maintained by various organizational levels within agencies, we could obtain only the following: Interior inspection activity and resource data for fiscal years 1975 through 1983; Interior

accident data for fiscal years 1975 through 1983; Coast Guard inspections and resource data for fiscal years 1980 through 1983; and Coast Guard accident data for calendar years 1981 through 1983. Although we used 1983 data, which were the most current data available at the time of our review, MMS provided us data for fiscal year 1984. That data showed little change in the number of facilities, inspections, inspectors, or violations. Coast Guard headquarters inspection program officials indicated that more facilities were inspected in fiscal year 1984 than in fiscal year 1983 because of an increased emphasis on offshore inspections although it did not inspect all facilities as required. Our review was conducted between September 1983 and August 1985.

To determine whether MMS and the Coast Guard are meeting the inspection requirements set forth in the 1978 OCS Lands Act Amendments and implementing regulations, we reviewed fiscal year 1983 inspection reports, inspection results, and the follow-up efforts by the MMS and Coast Guard field offices we visited. For the Pacific, Alaskan, and Atlantic OCS areas, we reviewed fiscal year 1983 inspections of federal offshore oil and gas facilities operating in those areas. For the MMS Gulf of Mexico OCS area, because of the large number of facilities, we selected a statistically random sample of 250 production facilities and 69 drilling facilities from a universe of 2,551 production facilities and 198 drilling facilities. For the Coast Guard's Gulf of Mexico OCS area, we sampled 250 production facilities and 23 drilling facilities from a universe of 2,551 production facilities and 198 drilling facilities. We used the sample to project the number and types of inspections, violations, and enforcement actions. The sample represents a sampling error of ± 10 percent at a 95-percent confidence level. (See app. I.) The Coast Guard also inspects offshore facilities that are no longer in service to ensure that they do not pose a hazard to navigation. However, officials could not provide us with a list of these facilities but estimated they represented about 1 percent of the total number of production facilities identified by MMS. Accordingly, they were not considered in our analysis.

We reviewed regulations providing penalties for offshore safety and environmental violations, and we obtained and analyzed fiscal 1980 through 1983 data on civil penalties imposed by MMS and the Coast Guard. We also reviewed accident data for the periods fiscal years 1975 through 1983 for Interior and calendar years 1981 through 1983 for the Coast Guard. In addition, we reviewed information regarding a recent court decision affecting the enforcement of civil penalty provisions and discussed the impact of this decision with knowledgeable MMS and Coast

Guard officials. We also reviewed MMS' proposed revised regulations for civil penalties, prepared as a result of the court decision.

In examining staffing levels dedicated to inspection activities, we looked at the operating expenses and staffing related to MMS inspection activities from fiscal year 1975 through 1983 and Coast Guard activities from fiscal year 1980 through 1983. We also discussed with MMS and Coast Guard headquarters and field officials their views on the adequacy of staffing and other resources to meet their inspection requirements.

We conducted our review in accordance with generally accepted government auditing standards. In accordance with the wishes of our requesters, we did not solicit official comments on a draft of this report; however, we discussed the results of our review with Interior and Coast Guard officials responsible for the activities included in this report and their comments are incorporated where appropriate.

Inspection Requirements Are Being Met for the Most Part Although Some Problems Exist

MMS generally met its requirement to annually inspect offshore oil and gas facilities; however, the Coast Guard did not. During fiscal year 1983 MMS inspected 96 percent of the 2,570 offshore production facilities and 94 percent of the 221 offshore drilling facilities. The Coast Guard inspected 69 percent of these production facilities and 96 percent of the 215 mobile drilling facilities. The Coast Guard did not inspect all production facilities in the Gulf of Mexico because of the large number of facilities and its limited inspection resources.

In addition to substantially meeting its requirement to conduct scheduled annual inspections of all OCS facilities, MMS conducted periodic unannounced inspections of most drilling facilities and over one third of the production facilities. The Outer Continental Shelf Lands Act, as amended, clearly requires an annual inspection of each OCS facility; however, the amendments do not define the term "periodic unannounced inspections." Neither MMS headquarters nor its regions have provided their inspectors with guidance regarding periodic unannounced inspections.

MMS' inspection strategy was not uniform among regions because it lacked central direction and was managed and administered by the individual OCS offices. However, MMS is restructuring its inspection program so that it will have clearly defined goals and will be consistently administered.

MMS and Coast Guard Inspection Requirements

Under the Outer Continental Shelf Lands Act, as amended, either individually or jointly, MMS and the Coast Guard must inspect OCS facilities at least once annually for compliance with safety and environmental regulations promulgated by the individual agencies. In addition to the scheduled annual inspection requirement, the 1978 amendments require MMS and the Coast Guard, either individually or jointly, to conduct periodic unannounced inspections. Although both agencies are charged with inspecting OCS facilities, each agency has unique jurisdictional responsibility.

MMS Inspection Responsibilities

MMS is responsible for regulating all mineral, exploration, drilling, and production operations on the OCS. MMS regulations are aimed at (1) ensuring that operations under federal oil and gas leases and permits on the OCS emphasize safety, the prevention of pollution, and the protection of life and property and (2) minimizing the risk of environmental damage. Some of the specific operations and areas regulated by MMS include

drilling exploratory wells, installing pipelines, measuring oil and gas production, and plugging and abandoning wells. MMS regulations are supplemented by OCS orders and notices issued by MMS regional offices.

MMS' inspections are conducted by technical personnel from each of its district offices. To standardize the inspection process, MMS has condensed its regulations, OCS orders, and notices into a checklist of questions that inspectors answer when reviewing drilling and production operations. The checklists are specifically tailored to each type of operation, i.e., drilling or production. Information on the specific facility and operations to be inspected—such as permit conditions, system schematics, and prior inspection reports—accompanies the checklist.

Coast Guard Inspection Responsibilities

The Coast Guard is generally responsible for regulating maritime and worker safety. Under the Outer Continental Shelf Lands Act, as amended, the Coast Guard promulgates and enforces regulations promoting the safety of life and property on OCS facilities and vessels. Included under the Coast Guard's authority are inspection and certification of commercial vessels engaged in OCS operations, licensing of certain marine personnel, supervision of the cleanup of oil discharges from facilities engaged in OCS activities, and safety of life in diving operations. The Coast Guard inspects OCS oil and gas production and drilling facilities. In addition the Coast Guard inspects and certifies all mobile (i.e., floating or oceangoing) offshore drilling facilities for their seaworthiness.

Inspection of OCS production facilities—one of many duties assigned to Coast Guard personnel—is conducted by Coast Guard Marine Safety Offices in Coast Guard districts having jurisdiction over the four federal OCS areas. These platform inspections determine the existence and adequacy of lifesaving and fire-fighting equipment aboard platforms and that personnel on board have received appropriate safety training. Each Coast Guard district uses inspection checklists to document and record inspection results. The checklists generally identify specific regulatory requirements for safety, lifesaving, and fire-fighting equipment and training. Because of additional safety requirements for platforms with personnel on board, these checklists are more extensive than those used on unmanned platforms.

In addition to inspecting production facilities, the Coast Guard inspects and certifies mobile offshore drilling units (MODU).¹ MODUs are vessels used for oil and gas drilling. Because MODUs are considered commercial vessels, the Coast Guard is required to certify the seaworthiness of each MODU biennially. MODU inspections and certification are more extensive than platform inspections since they involve examining the vessel's machinery, electrical installations, fire protection system, navigation and communication systems, and hull. In addition to certification inspections, the Coast Guard conducts a midperiod inspection 10 to 14 months after a certificate has been issued.

MMS Production Facility Inspections and Staffing

MMS is generally meeting its requirement for complete annual inspections of each offshore oil and gas production facility, inspecting 96 percent (2,455 of 2,570 facilities) in fiscal year 1983. As shown in table 2.1, the only two MMS OCS regions having production facilities—the Gulf of Mexico and the Pacific—conducted annual inspections on 96 percent and 95 percent, respectively, of the production facilities located in regional offshore areas. However, while both regions substantially met their inspection requirements, the ratio of inspectors to facilities differed greatly between the 2 regions—1 inspector for 102 facilities in the Gulf compared to 1 inspector for 3.8 facilities in the Pacific.

Table 2.1: MMS Inspections of Production Facilities (Fiscal Year 1983)

	MMS Region		Total
	Gulf of Mexico	Pacific	
Production facilities	2,551	19	2,570
Inspectors	25	5	30
Ratio of inspectors to facilities	1:102.0	1:3.8	1:85.7
Facilities with annual inspection	2,437 ^a	18	2,455
Facilities with no annual inspection	114 ^a	1	115
Percent of facilities with annual inspection	96.0 ^a	94.7	95.6
Total number of inspections	3,592 ^a	729	4,321
Average inspections per production facility	1.4 ^a	38.4	1.7

^aEstimates based on sample information. See appendix I for 95-percent confidence interval estimates.

¹The Coast Guard inspects all drilling facilities, including MODUs and production platform facilities that have drilling rigs attached. In addition, the Coast Guard inspects some MODUs that MMS would not inspect. For example, MMS would not inspect a MODU that was not drilling in an area; however, the Coast Guard would because it is a vessel.

More Frequent Production Inspections in the Pacific Region

Pacific region inspectors conducted 729 inspections of its 19 production facilities, a ratio of 38.4 inspections per facility. In the Gulf of Mexico region, in contrast, we estimate that MMS conducted 3,592 inspections of 2,551 production facilities, a ratio of 1.4 inspections per facility. This difference between the Pacific and Gulf of Mexico regions is due to the relative difference in the regions' workload and resources and more stringent environmental considerations in the Pacific. For example, the Gulf of Mexico region has 25 inspectors for 2,551 production facilities as compared to 5 inspectors for 19 production facilities in the Pacific region. Accordingly, Pacific region inspectors are able to conduct more inspections per facility—both complete annual inspections and unannounced inspections to spot-check production operations. Conversely, Gulf of Mexico inspectors, because of the large number of facilities, are able to conduct only the complete annual inspections. In addition, MMS Pacific, as well as headquarters, officials indicated that inspections are conducted more frequently in the Pacific region because of public environmental concerns resulting from the 1969 Santa Barbara blowout.

However, MMS Gulf of Mexico officials believe its current level of inspection effort and frequency are adequate. The officials stated that depending on the age of platforms, some should be inspected more than once a year, while others need to be inspected only every 18 to 24 months. The officials also said that the low number of OCS accidents in the Gulf indicates that MMS' inspection frequency and scope are adequate. For example, major accidents in the Gulf averaged about 6 per year from 1975 through 1983 during which time about 5,700 wells were completed. In all 4 MMS regions, 63 major accidents² occurred from 1975 through 1983 for the approximately 2,500 facilities.

MMS Drilling Facility Inspections and Staffing

In addition to inspecting production facilities, MMS conducted annual inspections of 94 percent of the 221 drilling facilities during fiscal year 1983. Drilling rigs are inspected more frequently than production platforms because drilling operations are more prone to accidents.

Because of the nature of drilling operations, MMS regional offices have established drilling inspection policies that provide for more frequent inspections. Inspectors in MMS' Pacific region visit drilling rigs to observe

²Major accidents in the Gulf of Mexico include oil spills of more than 238 barrels (10,000 gallons), blowouts, explosions, and fires that result in major structural damage or loss of life. Major accidents in the Pacific include major fires, deaths, serious injuries, and oil spills greater than 200 barrels within 30 days. Major accidents in Alaska include deaths, serious injuries, work stoppages exceeding 72 hours, and oil spills greater than 15 gallons.

well tests, plugging and abandonment operations, removal and recovery of well heads, and installation of on-site pollution control equipment.³ Similarly, Gulf of Mexico drilling inspection policy provides for inspection of all first wells drilled, plugging and abandonment operations, and certain well tests. MMS inspectors also inspect each drilling rig whenever it changes location. MMS inspected nearly all drilling rigs during fiscal year 1983 as can be seen in table 2.2.

Table 2.2: MMS Drilling Inspections (Fiscal Year 1983)

MMS Region	Drilling Rigs	Rigs Receiving Annual Inspections	Inspectors	Ratio of Inspectors to Rigs	Total Number of Inspections	Average Inspections Per Rig
Gulf of Mexico	198	186 ^a	18	1:11.0	1651 ^a	8.3 ^a
Pacific	19	16	5	1:3.8	876	46.1
Alaska	3	3	4	1:0.8	608	202.7
Atlantic	1	1	3	1:0.3	23	23.0
Total	221	206	30	1:7.4	3158	14.3

^aEstimates based on sample information. See appendix I for 95-percent confidence interval estimates.

Although MMS inspects drilling operations more frequently than production operations, a variation among MMS regions in the number of inspections per rig still exists as shown in table 2.2. As shown, the Gulf of Mexico region contains approximately 90 percent (198) of the total rigs and 60 percent (18 of 30) of the total drilling inspectors. In comparison to the Gulf of Mexico region, other MMS regions have fewer rigs but proportionately more inspectors who thus conducted more inspections per rig. MMS officials attributed the greater inspection frequency in the Pacific region to strong environmental concerns in the area stemming, partially, from the 1969 Santa Barbara blowout. In the Alaska region, the high inspection frequency was due to the region's policy of providing 24-hour inspection coverage. Alaska region inspectors, because of the great travel distances involved and the small number (two) of drilling rigs in the area, spend 7 days at a time on board a drilling rig. The inspectors conduct a complete inspection upon their arrival and daily inspections thereafter to spot-check operations.

³A well test is an examination of the various pressures exerted in the well to determine whether the oil or gas reservoir can produce in sufficient quantity to justify completing the well. Plugging and abandonment refers to the process of cementing the well hole at a point below the sea bed. A well-head is a structure installed at the top of the well that serves to cap the well, control the flow of oil or gas into a pipeline, and help control the well pressures that would lead to a blowout.

MMS Unannounced Inspections of Facilities

During fiscal year 1983 MMS conducted unannounced inspections of about one third of the OCS facilities. Although the Outer Continental Shelf Lands Act, as amended, requires periodic unannounced inspection of offshore facilities, the amendments do not define the term "periodic." MMS headquarters and its regions have not provided its inspectors with guidance regarding the frequency and scope of these unannounced inspections, although some unannounced inspections are made. The unannounced inspections aim at ensuring compliance with offshore safety and environmental regulations. The Pacific MMS region routinely conducts unannounced inspections. MMS officials in the three regions that do not make routine unannounced inspections indicated the reliance on availability of key company personnel to shut down equipment; the reliance on company-provided transportation; and the need to provide 24-hour inspection coverage because of the great travel distances involved as the reasons for not making more unannounced inspections.

Unannounced Inspection of Production Facilities

In the Gulf of Mexico region, we estimate about 29 percent of the 3,592 production inspections were unannounced. Almost 98 percent of the 729 production inspections in the Pacific region were unannounced. According to MMS Gulf of Mexico officials, production inspections are generally announced because much of the production equipment being inspected requires shutting down for testing and OCS operators must have certain company technical personnel present during these inspections. Because these personnel are not normally on board production facilities full-time, OCS operators must be notified beforehand to ensure their presence during inspections. In the Pacific, inspectors generally focus on production equipment that does not have to be shut down to be inspected.

Because of the large number of production facilities and the small number of inspectors, the Gulf of Mexico region averages 1.4 production inspections—announced and periodic unscheduled—per facility per year. The workload and staffing level allow, for the most part, one scheduled annual inspection of each production facility. The offshore operations director of the Gulf of Mexico region told us that he viewed the region's production inspection requirement as that of conducting an annual scheduled inspection of each facility. He did not consider periodic unannounced inspections of production facilities as a program requirement. MMS headquarters officials told us that the 1978 amendments dealing with periodic unannounced inspections are unclear. Accordingly, MMS headquarters has never specifically defined a requirement for periodic unannounced inspections. However, MMS is currently

in the process of defining "periodic unannounced inspections" and developing a policy on how to conduct such inspections.

In the Pacific region, in addition to the scheduled annual inspections, MMS inspectors make frequent unannounced inspections of production operations. During fiscal year 1983 the Pacific region inspected each production facility an average of 38.4 times. Practically all of these inspections, 98 percent, were unannounced. Pacific region inspection officials indicated that the production inspections often focus on areas not requiring equipment shutdown. Therefore, company technical personnel who are needed to shut down equipment during an inspection are not required to accompany the inspectors. Table 2.3 shows the percentage of MMS inspections made with and without advance notice.

Table 2.3: MMS Announced and Unannounced Production and Drilling Inspections (Fiscal Year 1983)

MMS Region	Production			Drilling		
	Inspections	Percent Announced	Percent Unannounced	Inspections	Percent Announced	Percent Unannounced
Gulf of Mexico ^a	3,592	71.1	28.9	1,651	9.6	90.4
Pacific	729	2.5	97.5	876	5.9	94.1
Alaska	b	b	b	608	100.0	0
Atlantic	b	b	b	23	100.0	0

^aEstimates based on sample information. See appendix I for 95-percent confidence interval estimates.

^bNo OCS production activity took place in the Alaska and Atlantic regions during fiscal year 1983.

Unannounced Inspection of Drilling Facilities

Drilling facilities, unlike production facilities, do not require extensive shutdown of equipment for inspections. Although most drilling inspections in the Gulf of Mexico and Pacific regions are done without advance notice, OCS operators in the the Alaska and Atlantic regions were generally aware beforehand of MMS inspection visits. In Alaska, MMS inspectors spend 7 days at a time on board drilling vessels because of the great travel distance involved (up to 800 miles one way). MMS provides 24-hour inspection coverage, and inspectors are responsible for conducting both a complete inspection and daily inspections to spot-check operations. MMS officials stated that this inspection arrangement is economical and helps ensure operator compliance. In the Atlantic region, MMS inspectors were provided company transportation to the single drilling rig located approximately 100 miles offshore. Because transportation has to be arranged in advance, the OCS operator is aware of MMS' inspection visits. Company transportation is used, according to MMS officials,

because MMS' leasing of helicopter transportation to inspect one facility is not cost effective.

MMS Efforts to Strengthen Program Management

Because individual OCS regional offices had different inspection strategies and there was limited MMS headquarters involvement, the offshore inspection program lacked central direction and did not have well defined goals and objectives. Neither was inspection strategy uniformly applied throughout the country. Recognizing this, in 1983, MMS undertook a nationwide restructuring of the management of its offshore inspection program. It has implemented certain changes in the program and plans to implement others, aimed at clearly defining program goals and objectives, including consolidating regulations with nationwide applicability, documenting inspection procedures, maintaining uniform data, and periodically reviewing program results.

Lack of Central Program Management

Although MMS' offshore inspection program has been operational since the early 1970's, MMS has not managed the program using the elements of sound management that are integral parts of a comprehensive federal program. These essential elements include goals and objectives, data collection and analysis, monitoring mechanisms, and evaluations. Without these elements management does not have a basis to evaluate program performance and make reasoned decisions regarding resource allocations. MMS headquarters inspection program officials told us that MMS' inspection program has been characterized by autonomous regions, a lack of uniformity, and very little involvement by headquarters. Aside from the overall requirement set forth in the 1978 OCS Lands Act Amendments to conduct scheduled annual and periodic unannounced inspections of offshore oil and gas facilities, MMS did not have specifically defined and documented inspection program goals and objectives. In an overall sense, MMS' inspection program goal was to ensure compliance with applicable OCS regulations; however, no specific national goals or objectives existed that addressed the nature, frequency, and type of inspections to be performed by MMS inspectors. Instead, each of the four MMS regional offices developed broad policies aimed at ensuring compliance with the legislative requirement.

Regional policies represented significantly different inspection strategies and were not documented. For example, no documented regional policy was in force concerning the frequency of drilling inspections. Gulf of Mexico inspections were made generally to inspect all first wells drilled, plugging and abandonment operations, and certain well tests.

Pacific inspectors, however, made more frequent inspections and inspected additional operations. Because of travel distances to offshore Alaska facilities, inspectors stayed on board for 7 days at a time and provided 24-hour inspection coverage.

Although every MMS region inspected drilling operations, inspection frequency varied significantly among the regions. For example, during fiscal year 1983 drilling inspection frequency among the 4 OCS regional offices ranged from 8 to 203 inspections per drilling facility. While resource allocation and the number of drilling facilities located in the respective regions contributed to this varying frequency rate, differences in regional inspection strategies were also a factor. Even within regions, inspection frequency varied considerably among district offices. For example, during fiscal year 1983 the frequency rate for drilling inspections among district offices in the Gulf of Mexico region ranged from 3.4 to 13.8 inspections per drilling facility.

Inspection checklists also varied among MMS regions. MMS promulgates regulations, OCS orders, and notices to OCS operators covering various areas of OCS operations. Although the regulations are national in scope, OCS orders and notices to OCS operators are region-specific. All four MMS regions have issued a varying number of OCS orders and notices supplementing MMS regulations and providing more specific operational directives to OCS operators. Because of regional differences in these supplemental regulations, orders, and notices, inspection checklists vary among regions. We were told by MMS headquarters officials that differences occurred because of regional operating environs and regional public sentiment and also because regulations had not been uniformly applied and were based on a regional perspective.

MMS regional offices provided monthly, quarterly, and annual inspection data to MMS headquarters. Included in the data were the number of inspections, number of facilities, and number of violations issued. However, because no uniform method existed among regions for classifying and collecting the data, comparisons were difficult to make. As a result, MMS headquarters was not able to determine whether differences in results were serious and required management attention or were site-specific and needed no further action.

Program Management Improvements

In recognizing inspection program weaknesses, MMS has recently implemented and planned several new management initiatives to improve management of its OCS inspection program. These include streamlining

and consolidating OCS regulations, orders, and lease compliance requirements; developing an inspection handbook that sets out written inspection goals and objectives; establishing a nationwide inspection checklist and uniform enforcement actions; automating the inspection data base; and establishing an internal review mechanism to periodically assess program results.

Consolidation of Regulations

In mid-1983 MMS established a regulatory reform task force to streamline and consolidate the MMS regulations and OCS orders. As mentioned previously, in addition to the regulations promulgated by MMS headquarters, MMS regional offices have issued a varying number of OCS orders and notices supplementing the regulations. The regulatory reforms task force is transforming the regulations and regional OCS orders into one set of offshore operating rules. MMS officials indicated that having one set of offshore operating rules should provide consistent requirements to OCS operators. MMS anticipates issuing the offshore operating rules by December 1985.

Documentation of Inspection Policies and Procedures

According to MMS headquarters officials, MMS' objective is to establish an offshore inspection program that ensures fair and consistent MMS offshore inspections. In May 1983 MMS released the first chapter of the MMS manual that describes its offshore inspection program, sets forth program policy, and establishes responsibility for program management and implementation. Specifically, this chapter of the manual sets forth MMS' offshore inspection authority and the specific inspection requirements imposed on MMS; identifies the areas of offshore operations and activities that relate to the inspection requirements; and delineates the inspection program responsibilities of headquarters, regional, and district offices.

In September 1984 MMS developed a nationwide inspection checklist. This checklist sets forth the specific items or activities that are to be inspected, cites the relevant regulatory requirement and authority, and indicates prescribed enforcement actions. Although the checklist establishes specific inspection items that are common in all OCS regional areas, it also allows for inclusion of region-specific inspection requirements.

In July 1985 MMS completed the headquarters' segment of the offshore inspection handbook. The handbook defines the controls to be used by

MMS headquarters and regional offices in managing the inspection program. In addition, the handbook will document the inspection procedures to be used by MMS district inspectors.

Automated Inspection Data Base

MMS is developing a nationwide automated inspection data base in response to a headquarters need for timely and consistent inspection data that will be used to monitor program results. As planned, the automated inspection data base will include information on drilling, production, and pipeline inspections. In addition to the oversight application of the data, the data base will be shared with MMS district and regional offices. MMS estimates the automated inspection data base will be completed by May 1986.

Internal Review and Training

The inspection handbook being developed by MMS will include a provision for internal review of the inspection program activities. Internal reviews will assess compliance by regions and districts with established policies and procedures and will identify problem areas needing management attention. Although MMS had been conducting internal reviews of district inspection efforts, the reviews were conducted on an ad hoc, rather than routine, basis and the results were not used to assess whether similar problems were occurring in other locations or whether other problems existed. Currently, MMS plans to establish an internal review unit, within its Office of Program Support and Coordination, that will conduct annual reviews of regional office compliance with inspection program objectives, policies, and procedures. The regions, in turn, will conduct internal reviews of the districts.

MMS also plans to establish a formal training program for inspectors. Currently, MMS inspectors receive mostly on-the-job training and some technical training provided largely by industry. The proposed new training program will include regulatory and technical training, training for new inspectors, and refresher training for all inspectors. MMS is currently developing the specific training courses.

Coast Guard
Inspections of Facilities
and Staffing

The Coast Guard inspects OCS drilling and production operations to assess compliance with the OCS Lands Act, its 1978 amendments, and federal regulations relative to safety of life and property on OCS facilities. Inspections of production facilities are to ensure that lifesaving and fire-fighting equipment are on the facilities and that personnel on board have received appropriate lifesaving training. The Coast Guard inspects

mobile offshore drilling units (MODU) to ensure and certify that the MODU is seaworthy. In addition to inspecting lifesaving and fire-fighting equipment, MODU inspections involve inspecting the vessel's machinery, electrical systems, pumps, communications systems, and hull.

During fiscal year 1983 the Coast Guard did not inspect all OCS production facilities in the Gulf as required, although it met this requirement in the Pacific as can be seen in table 2.4.

Table 2.4: Coast Guard Inspections of Production Facilities (Fiscal Year 1983)

	Coast Guard District		Total
	8 District Gulf of Mexico	11 District Pacific	
Production facilities	2,551	14 ^a	2,565
Inspectors	17	11	28
Ratio of inspectors to facilities	1:150.1	1:1.3	1:91.6
Facilities with annual inspections	1,763 ^b	14	1,777
Facilities with no annual inspections	788 ^b	0	788
Percent with annual inspections	69.1 ^b	100.0	69.3
Total inspections	1,841^b	25	1,866
Average inspections per production facility	.7^b	1.8	.7

^aThere were 19 production facilities in the MMS Pacific region; however, 5 of the 19 were not inspected by the Coast Guard's 11th District because they were not offshore platforms but rather onshore production processing facilities.

^bEstimates based on sample information. See appendix I for 95-percent confidence interval estimates.

Our sample showed that although the Coast Guard's 8 District, Gulf of Mexico area office, inspected 69.1 percent of the production facilities, somewhat more (83.1 percent) of the manned facilities were inspected, while 66.7 percent of the unmanned facilities received inspections. Coast Guard officials told us that during fiscal year 1983 the Coast Guard prioritized its inspection efforts because it did not have sufficient funding for helicopter transportation necessary to inspect all facilities. The Coast Guard emphasized inspecting MODUS first and then manned production facilities. As shown in table 2.5, in fiscal year 1983 the Coast Guard inspected 207 of 215 MODUS that required inspections.

Table 2.5: Coast Guard Drilling (MODU) Inspections (Fiscal Year 1983)

Coast Guard District	MODUs	Inspectors	Ratio of Inspectors to MODUs	MODUs With Annual Inspection	Total Inspections	Average Inspections Per MODU
8 District Gulf of Mexico	198 ^a	17	1:11.6	198	379	1.9
11 District Pacific	14 ^b	11	1:1.3	6	6	0.43
17 District Alaska	3	4	1:0.75	3	3	1.0

^aEstimates based on sample information. See appendix I for 95-percent interval estimate.

^bFor the eight MODUs that were not inspected, inspection files were not available for five, two had started work during FY 1983 but had not yet been inspected, and one had been inspected during FY 1982.

According to a Coast Guard headquarters inspection program official, in May 1983 Coast Guard headquarters decided to make a concerted effort to inspect as many facilities in the 8th District as possible. On the basis of advice from the 8th District, an additional \$200,000 was allocated for helicopter transportation during the remainder of fiscal year 1983. This increase in funding, coupled with the headquarters' desire to increase coverage, resulted in a greater proportion of inspections being made during the latter part of the fiscal year, particularly in the fourth quarter. According to this official, continued emphasis on offshore inspections and increased funding in fiscal year 1984 resulted in all MODUs and about 95 percent of all other facilities being inspected.

Conclusions

MMS substantially met its requirement during fiscal year 1983 to conduct scheduled annual inspections. MMS inspected 94 percent of the offshore drilling and 96 percent of the offshore production facilities. MMS also conducted periodic unannounced inspections of about one third of the OCS facilities. Although the Outer Continental Shelf Lands Act, as amended, requires periodic unannounced inspections of OCS facilities, the amendments do not specify how often such inspections should be performed for each facility. MMS has not established a policy concerning unannounced inspections, and regions view the need for them differently.

Although MMS substantially met its requirement for scheduled annual inspections, significant variances existed in the resources allocated for these inspections and the inspection results. For example, the average ratio of number of inspectors per drilling facility ranged from 1 to 11 in the Gulf of Mexico region to 1 to 0.3 in the Atlantic region. In addition, 25 Gulf of Mexico region production inspectors conducted an average of

1.4 inspections of each of 2,551 production facilities, whereas 5 Pacific region production inspectors averaged 38.4 inspections for each of 19 production facilities. These and other differences were due to differences in relative workload and resource allocation, regional public opinion about offshore development, and varying regional inspection strategies.

The Coast Guard did not inspect all production facilities in the Gulf of Mexico as required in fiscal year 1983 but did inspect all mobile offshore drilling units. Resource limitations—helicopter transport—required the Coast Guard to prioritize its inspection efforts.

MMS' actions to strengthen its inspection program by centralizing management at the headquarters level, documenting program goals and procedures, establishing uniform criteria and data bases, and providing for internal review and monitoring should enhance overall program management. We encourage MMS' efforts to better define program objectives and improve data gathering as a means of providing a better base for monitoring program results. Because MMS has taken recent actions to strengthen its inspection program and the Coast Guard has increased its emphasis on offshore inspections, we are making no recommendations.

How MMS and the Coast Guard Deal With Inspection Violations

During fiscal year 1983 MMS inspectors found about 1.2 violations per inspection for the 4,321 production inspections it conducted. These violations ranged from faulty valves for monitoring oil and gas pressures to improper record maintenance. MMS found relatively fewer violations during its 3,158 drilling inspections—16 violations per inspection. Drilling violations included improper design, maintenance, and testing of blowout prevention equipment and improper discharges of materials. In the Gulf of Mexico, 71 percent of the production and 45 percent of the drilling violations resulted in temporarily shutting down part of the facility. In contrast, in the Pacific region only 1 percent of the production and 19 percent of the drilling violations resulted in temporary shut-downs of part of the facility. The Coast Guard cited about 1.1 violations per inspection of production facilities and 2.8 violations per inspection of drilling facilities. Coast Guard inspection violations mainly involved missing or inoperable lifesaving or other equipment.

Little follow-up took place on violations cited during inspections of production facilities. Instead, MMS and the Coast Guard relied on OCS operators to notify them that violations had been corrected. However, MMS and the Coast Guard generally followed up on violations cited during drilling inspections by making subsequent visits to ensure that violations had been corrected.

In 54 instances from 1980 through 1982, MMS instituted civil penalty proceedings against OCS operators for violating safety or environmental regulations. However, in 1983 a federal court ruled that MMS had to allow operators a reasonable length of time before assessing penalties. MMS changed its civil penalties procedures and has not assessed any civil penalties since that time.

MMS Violations

Violations are infractions of MMS safety and environmental regulations. During inspection of offshore facilities, MMS inspectors use checklists to note whether all required safety devices and equipment are installed and operating properly and whether required operating procedures are followed. MMS inspectors also examine the overall operation of each production and drilling facility to verify that equipment and components are properly interconnected and operating as a unit to ensure safe operations.

When a violation is found, the MMS inspector records it as an incident of noncompliance. For each violation, or noncompliance, found, a specific enforcement action (penalty) is prescribed ranging from a warning to a

partial or total shutdown (work stoppage) of operations. For example, if an operator is found disposing oil or harmful waste material in the water, the MMS inspector would shut down operations of the facility until the discharge is stopped and corrected. For less serious infractions, such as failure to properly identify the facility, the MMS inspector would issue warnings.

Once a violation is found, MMS allows the operator 7 days to correct the condition and notify MMS. Upon notification that the violation has been corrected, MMS either reinspects the facility to ensure compliance or relies on the operator's statement that the violation has been corrected.

Number of Violations

Table 3.1 shows the number of violations cited by MMS during fiscal year 1983 production and drilling inspections.

Table 3.1: Violations Cited During MMS Production and Drilling Inspections (Fiscal Year 1983)

MMS Region	Production			Drilling		
	Inspections	Violations Cited	Ratio of Violations to Inspections	Inspections	Violations Cited	Ratio of Violations to Inspections
Gulf of Mexico ^a	3,592	4,790	1.3:1	1,651	475	0.3:1
Pacific	729	272	0.4:1	876	26	.03:1
Alaska	^b	^b	^b	608	17	.03:1
Atlantic	^b	^b	^b	23	0	0
Total	4,321	5,062	1.2:1	3,158	518	0.16:1

^aEstimates based on sample information. See appendix I for 95-percent confidence interval estimates.

^bNo OCS production activity took place in the Alaska and Atlantic regions during fiscal year 1983.

As shown in table 3.1, the Gulf of Mexico region cited over 3 times more production violations per inspection than the Pacific region and 10 times more drilling violations per inspection. According to an MMS Pacific region official, because its inspectors check drilling and production operations more frequently than inspectors in the Gulf of Mexico, operators are more aware of an inspector "presence," which might explain the proportionately fewer violations found in the Pacific region.

Types of Violations

The inspection checklists differed somewhat by MMS region. The production checklist contained 170 possible violations while the various drilling inspection checklists contained as many as 117 items. Tables 3.2 and

3.3 show the percentages of violations found during production and drilling inspections by general type of violation.

Table 3.2: Types of Violations Found During MMS Production Inspections (Fiscal Year 1983)

Violation Type or Category	Percentage of Total Violations Cited		
	Gulf of Mexico Region ^a (%)	Pacific Region (%)	Combined Percentage (%)
Fire-fighting equipment, fire and discharge prevention equipment	16.5	16.2	16.4
Safety and pressure valves on wells	32.8	22.4	29.0
Safety and pressure valves on pipelines and pipeline pumps	7.0	12.5	9.0
Protection of pressure, flow, and atmospheric vessels	22.2	21.0	21.7
Compressor safety and pressure valves	3.0	8.1	4.9
Safety in welding operations	•	0.7	0.3
Temperature and relief valves on heaters and generators	0.4	3.3	1.5
Maintenance record, equipment testing, and performance of safe and workmanlike operations	18.0	15.8	17.2
Total	99.9^b	100.0	100.0

^aActual percentages from Gulf of Mexico sample.

^bDifference due to rounding.

As can be seen in table 3.2, most of the production violations cited related to safety and pressure valves associated with producing wells. The second most frequently cited violations were for inadequate protection of pressure and atmospheric vessels. According to an MMS official, the installation and maintenance of safety and pressure valves are important because these valves serve to monitor the pressure of oil and gas flowing from the well and to automatically shut down the flow if safe pressure limits are exceeded. Similarly, atmospheric valves monitor temperature and flow characteristics of oil and gas so as to detect unsafe conditions.

The third most frequently cited category of production violations related to record maintenance, equipment testing, and safe and workmanlike operations. The records referred to include records of all surface safety valves and records that indicate whether the operator has determined the operating pressure ranges of all flow lines and tested

each pressure relief valve. Equipment testing violations refer to operators' performing periodic tests of pressure, safety, level, and temperature valves and instruments and fire-fighting and fire and gas detection systems.

Table 3.3: Types of Violations Found During MMS Drilling Inspections (Fiscal Year 1983)

Violation Type or Category	Percentage of Total Violations Cited			
	Gulf of Mexico Region ^a (%)	Pacific Region (%)	Alaska Region (%)	Combined Percentage (%)
Discharges and discharge prevention equipment	22.4	15.4	11.8	20.5
Safe and workmanlike operations	15.8	7.7	29.4	15.9
Electrical and fire-sensing equipment and welding practices	15.8	•	•	12.3
Installation and testing of casing ^b	6.6	7.7	5.9	6.7
Hydrogen sulfide monitoring equipment	•	19.2	•	2.6
Use, condition, and testing of drilling mud ^c	13.2	•	17.6	11.8
Maintenance, design, and testing of surface and subsea-floor blowout preventives for wells	25.0	50.0	35.3	29.2
Unauthorized resumption of operations and mud seepage	1.3	•	•	1.0
Total	100.1^d	100.0	100.0	100.0

^aActual percentages from Gulf of Mexico sample.

^bCasing is steel pipe used in wells to seal off fluids in the rocks from the well hole to prevent the walls of the hole from caving in.

^cDrilling mud is a special mixture of clay, water or refined oil, and chemical additives pumped down the hole through a drill pipe and drill bit. Drilling mud cools the rapidly turning bit, lubricates the drill pipe as it turns, carries rock cuttings to the surface, and serves as a plaster to help prevent the well from crumbling or collapsing.

^dDifference due to rounding.

The two drilling violation categories most frequently cited were (1) inadequate maintenance and testing of blowout prevention equipment and (2) discharges and inadequate maintenance of discharge prevention equipment. Blowout prevention equipment is installed on the sea floor at the top of the well casing to control pressure. The cited violations covered design, maintenance, and testing of blowout prevention equipment and training of personnel in blowout prevention techniques. Violations cited for discharges included actual leakage of oil or harmful waste

into the ocean and inadequate equipment installed to prevent discharges.

The third largest category of drilling violations cited by MMS inspectors was unsafe and unworkmanlike practices by personnel, and unsafe equipment usage. According to an MMS official, many of the violations are associated with workover operations. Because workovers involve removing and replacing thousands of feet of pipe at producing wells, a high risk exists that any mishap will pose a threat to the producing wells.

MMS Enforcement Actions and Follow-Up

As previously stated, certain prescribed enforcement actions exist for violations cited during MMS inspections. These enforcement actions include issuing warnings to operators, specifying a time limit to correct the violation; shutting down components or equipment that is in violation; or shutting down a well or entire drilling or production operation. Tables 3.4 and 3.5 show the enforcement actions MMS took for violations cited during fiscal year 1983.

Chapter 3
How MMS and the Coast Guard Deal With
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Table 3.4: MMS Enforcement Actions for Production Violations (Fiscal Year 1983)

Violation Type or Category and Type of Action	Percentage of Warnings and Shutdowns		
	Gulf of Mexico Region* (%)	Pacific Region (%)	Combined Percentage (%)
Fire-fighting equipment, fire and discharge prevention equipment			
Warning	46.1	100.0	65.8
Shutdown	53.9	0	34.2
Safety and pressure valves on wells			
Warning	7.9	95.1	33.0
Shutdown	92.1	4.9	67.0
Safety and pressure valves on pipelines and pipeline pumps			
Warning	3.1	100.0	53.0
Shutdown	96.9	0	47.0
Protection of pressure, flow, and atmospheric vessels			
Warning	7.8	100.0	40.9
Shutdown	92.2	0	59.1
Compressor safety and pressure valves			
Warning	7.1	100.0	63.9
Shutdown	92.9	0	36.1
Safety in welding operations			
Warning	0	100.0	100.0
Shutdown	0	0	0
Temperature and relief valves on heaters and generators			
Warning	0	100.0	81.8
Shutdown	100.0	0	18.2
Maintenance record, equipment testing, and performance of safe and workmanlike operations			
Warning	92.8	100.0	95.2
Shutdown	7.2	0	4.8
Total			
Warning	29.1	98.9	55.1
Shutdown	70.9	1.1	44.9

*Actual percentages from Gulf of Mexico sample.

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Table 3.5: MMS Enforcement Actions for Drilling Violations (Fiscal Year 1983)

Violation Type or Category and Type of Action	Percentage of Warnings and Shutdowns			Combined Percentage (%)
	Gulf of Mexico Region ^a (%)	Pacific Region (%)	Alaska Region (%)	
Discharges and discharge prevention equipment				
Warning	64.7	100.0	100.0	70.0
Shutdown	35.3	0	0	30.0
Safe and workmanlike operations				
Warning	54.2	100.0	100.0	64.5
Shutdown	45.8	0	0	35.5
Electrical and fire-sensing equipment and welding practices				
Warning	70.8	0	0	70.8
Shutdown	29.2	0	0	29.2
Installation and testing of casing				
Warning	70.0	100.0	100.0	76.9
Shutdown	30.0	0	0	23.1
Hydrogen sulfide monitoring equipment				
Warning	0	20.0	0	20.0
Shutdown	0	80.0	0	80.0
Use, condition, and testing of drilling mud				
Warning	20.0	0	100.0	30.4
Shutdown	80.0	0	0	69.6
Maintenance, design, and testing of surface and subsea-floor blowout preventives for wells				
Warning	55.3	92.3	83.3	66.7
Shutdown	44.7	7.7	16.7	33.3
Unauthorized resumption of operations and mud seepage				
Warning	0	0	0	0
Shutdown	100.0	0	0	100.0
Total				
Warning	55.3	80.8	94.1	62.1
Shutdown	44.7	19.2	5.9	37.9

^aActual percentages from Gulf of Mexico sample.

As shown in tables 3.4 and 3.5, the Gulf of Mexico region inspectors issued, totally and proportionately, most of the violations that resulted in some type of operational shutdown. As stated earlier, shutdowns are considered a more serious enforcement action than warnings because shutdowns can slow or stop production or drilling. An MMS official told us that the incidence of shutdowns is higher in the Gulf of Mexico because drilling and production operations have taken place there for

many years. As a result, many of the facilities and much of the equipment have been in service longer, would more likely need maintenance, and thus would fail inspection.

The type of violation determines the type of the enforcement action called for by MMS' checklist. For example, the most frequently cited types of production violation—improperly set or inoperable safety and pressure valves—generally resulted in shutdowns as opposed to warnings (see table 3.4). The most frequently cited type of drilling violation—failure to test blowout prevention equipment or failure to record such tests—resulted in more warnings than shutdowns (see table 3.5).

Not All Violations Followed Up by MMS

MMS officials told us that for many of the violations cited during inspections, OCS operators take corrective action while the inspector is present. In cases where corrections are not made immediately, MMS allows operators 7 days to correct the violation and to notify MMS of the correction. We found that operators generally notified MMS within the prescribed time frame. However, MMS did not conduct separate follow-up inspections in all regions to verify that corrective actions had been taken.

MMS inspectors generally witnessed corrections or followed up drilling violations in all regions and production violations in the Pacific region. About 83 percent of the drilling violations were either corrected while the inspector was at the site or followed up by reinspection of the facility. Similarly for production inspections in the Pacific region, inspectors were present when violations were corrected or subsequently made reinspections to ensure the violations had been corrected for about 70 percent of the violations. However, for production violations in the Gulf of Mexico region, follow-up inspections were not generally made unless MMS had shut down operations because of the violation. Gulf of Mexico inspectors witnessed corrections or made follow-up inspections for about 49 percent of the production violations. MMS placed more reliance on the operators in the Gulf of Mexico to correct violations and notify it because its limited number of inspectors did not allow the region to reinspect production facilities as frequently as drilling or production inspectors in the Pacific region.

Civil Penalty Program

Under the Outer Continental Shelf Lands Act, as amended, after a hearing MMS may assess a civil penalty of up to \$10,000 per day for a violation of OCS regulations and the failure by OCS operators to take

corrective action within a "reasonable period." The civil penalty provision is an enforcement mechanism in addition to the warnings and shut-downs discussed earlier. The Coast Guard and other federal agencies operating under the act's authority may also refer violations of their regulations to MMS for civil penalty proceedings.

During the period January 1980 through December 1982, MMS instituted 54 civil penalty proceedings against offshore operators for various violations of safety and environmental regulations. Of the 54 cases, 53 were instituted in the Gulf of Mexico region and 1 in the Pacific region. MMS assessed approximately \$1.1 million in fines for the 54 cases, with individual assessments ranging from \$1,000 to \$180,000. About one third of the civil penalty cases involved discharges of oil or harmful substances.

In 1982 an oil company filed a suit alleging MMS had improperly implemented and enforced the civil penalty provision of the act by not allowing the companies a reasonable time to correct the violations before assessing civil penalties. MMS assessments in the case totaled \$31,000. On May 23, 1983, a federal district court ruled in favor of the company, holding that civil penalties may be assessed only for violations that continue after companies have been given a reasonable time period to correct the violation and failed to correct it.

Following the ruling MMS changed its civil penalty procedures to allow the opportunity to correct a violation within a reasonable time period prior to a penalty assessment. MMS officials indicated that operators would probably correct violations, even long-standing or repeated ones, following notice of the violation; and therefore it was unlikely that any civil penalties would be imposed. Several MMS inspectors told us, however, that the amount of penalty imposed on companies through the civil penalty program is not as much of a deterrent as a shutdown, which causes a costly interruption of production or drilling operations.

We were advised by MMS' Chief of Program Support and Coordination that since the court decision and the rewriting of the civil penalty procedures, MMS has not instituted any civil penalty cases against OCS operators because violations were corrected.

Coast Guard Violations and Follow-Up

During fiscal year 1983 the Coast Guard cited about 1.1 violations for each production platform and 2.8 violations for each MODU inspected. The Coast Guard usually did not reinspect production facilities to ensure

that violations had been corrected, although it did reinspect MODUs. In a few instances the Coast Guard did not report all the violations found during inspections because they had been corrected during the inspections.

Violations Cited by the Coast Guard

During fiscal year 1983 Coast Guard inspectors cited approximately 2,100 safety violations during OCS production inspections and about 1,100 violations during MODU inspections. Table 3.6 shows the distribution of Coast Guard inspection violations among the three Coast Guard districts reviewed.

Table 3.6: Coast Guard Violations Cited During Production and Drilling (MODU) Inspections^a(Fiscal Year 1983)

Coast Guard District	Production			Drilling		
	Inspections	Violations Cited	Ratio of Violations to Inspections	Inspections	Violations Cited	Ratio of Violations to Inspections
8th District Gulf of Mexico ^b	1,841	2,012	1.1:1	379	1,056	2.8:1
11th District Pacific	25	58	2.3:1	6	13	2.2:1
17th District Alaska	^c	^c	^c	3	7	2.3:1
Total	1,866	2,070	1.1:1	388	1,076	2.8:1

^aThe term "violation" is used by GAO to describe the Coast Guard's term "deficiencies."

^bEstimates based on sample information. See appendix I for 95-percent confidence interval estimates.

^cNo OCS production activity took place in the Alaska district during fiscal year 1983.

Coast Guard violations cited during production inspections involved mostly inoperable or missing lifesaving equipment and navigation aids. For example, many of the facilities were cited for having an insufficient number of or improperly marked lifefloats, ring life buoys, and other floatation devices. In addition, others were cited for inoperable signal lights and fog horns. Inspections of MODUs, although finding violations of lifesaving equipment and navigation aids, more often found violations involving operational equipment and systems aboard the vessels. For example, MODU violations cited improper conditions of generating equipment, pressure-gauging equipment, pump valves and seals, shafts, and the currency and completeness of logs and records.

Coast Guard Follow-Up

Coast Guard follow-up of inspection violations varied according to whether a production facility or MODU had been inspected. Following a production inspection the Coast Guard sent a letter to the OCS operator listing the violations found and requesting written notification when the

corrections had been made. In most instances the Coast Guard allowed OCS operators up to 30 days to correct violations. However, extensions of the 30-day period could have been granted if justified by the operator. If written notification was not provided within the response period, the Coast Guard again wrote the operator requesting a written response and informing the operator that failure to respond could result in a civil penalty of up to \$10,000 per day. The Coast Guard refers violations of safety regulations to MMS for civil penalty proceedings.

Operators generally responded by letter to the Coast Guard within the initial response period. Except for 12 follow-up inspections by the Coast Guard inspectors—10 in the Pacific and 2 in the Gulf of Mexico—little additional follow-up took place except for ensuring that the Coast Guard received operators' written responses indicating they had corrected violations found during production inspections. Coast Guard 8th District (Gulf of Mexico) officials stated that the lack of staff and helicopters prohibited follow-up inspections on production facilities. The officials added that companies' responsiveness to correcting violations had been good and thereby precluded committing additional resources to follow-up inspections.

During fiscal year 1983 the 11th District (Pacific) cited violations during three MODU inspections but did not conduct any follow-up inspections. The Coast Guard 8th District (Gulf of Mexico), during fiscal year 1983, followed up on 85 percent of the MODU inspections in which violations had been cited. Follow-up inspections were performed either by the inspection office that initially cited the violations or by the inspection office conducting the next inspection.

Conclusions

MMS and the Coast Guard have cited relatively few violations of offshore safety and environmental standards. Where violations were found, MMS' Gulf region tended to require that part or all of the facility be shut down until repairs were made. By contrast, the Pacific region cited proportionately fewer violations and issued warnings more often than shutting down facilities. For violations found during inspections of drilling facilities, both MMS and the Coast Guard generally followed up to ensure that violations had been corrected. However, for production facilities, they generally relied on notification from offshore operators that the violation had been corrected. We found that both MMS and the Coast Guard received such notifications within the specified time but, except for MMS' Pacific region, did not conduct on-site follow-up inspections.

Chapter 3
How MMS and the Coast Guard Deal With
Inspection Violations

Because of a 1983 federal district court ruling, MMS modified its civil penalties procedures to allow operators a reasonable time after a violation is cited before assessing a civil penalty. MMS officials told us that operators would probably correct any violations following notice of violation, and therefore it was unlikely any civil penalties would be imposed. MMS inspectors, however, told us that a shutdown, which is a costly interruption of production or drilling operations, is more of a deterrent than a civil penalty.

Confidence Intervals for Gulf of Mexico Estimates

Table I.1: 95-Percent Confidence Intervals for Gulf of Mexico Estimates in Table 2.1

	Estimate	Lower Bound	Upper Bound
Facilities with annual inspections	2,437.4	2,305.1	2,551.0
Facilities with no annual inspection	113.6	107.4	119.8
Percent of facilities with annual inspections	95.5	90.4	100.0
Total number of inspections	3,591.8	3,559.1	3,624.6
Average inspections per facility	1.4	1.4	1.4

Table I.2: 95-Percent Confidence Intervals for Gulf of Mexico Estimates in Table 2.2

	Estimate	Lower Bound	Upper Bound
Rigs with annual inspections	185.8	164.6	207.1
Rigs with no annual inspection	12.2	10.8	13.5
Percent of facilities with annual inspections	93.9	83.1	100.0
Total number of inspections	1,651.2	1,183.7	2,118.6
Average inspections per rig	8.3	6.0	10.7

Table I.3: 95-Percent Confidence Intervals for Gulf of Mexico Estimates in Table 2.3

	Estimate	Lower Bound	Upper Bound
Production			
Total inspections	3,591.8	3,559.1	3,624.6
Percent announced	71.1	64.6	77.5
Percent unannounced	28.9	26.3	31.5
Drilling			
Total inspections	1,651.2	1,183.7	2,118.6
Percent announced	9.6	9.1	10.0
Percent unannounced	90.4	86.2	94.6

Table I.4: 95-Percent Confidence Intervals for Gulf of Mexico Estimates in Table 2.4

	Estimate	Lower Bound	Upper Bound
Platforms with annual inspections	1,762.7	1,555.1	1,970.4
Percent with annual inspections	69.1	61.0	77.2
Total number of inspections	1,840.6	1,829.5	1,851.7
Average inspections per production facility	0.7	0.7	0.7

**Appendix I
Confidence Intervals for Gulf of
Mexico Estimates**

Table I.5: 95-Percent Confidence Intervals for Gulf of Mexico Estimates in Table 2.5

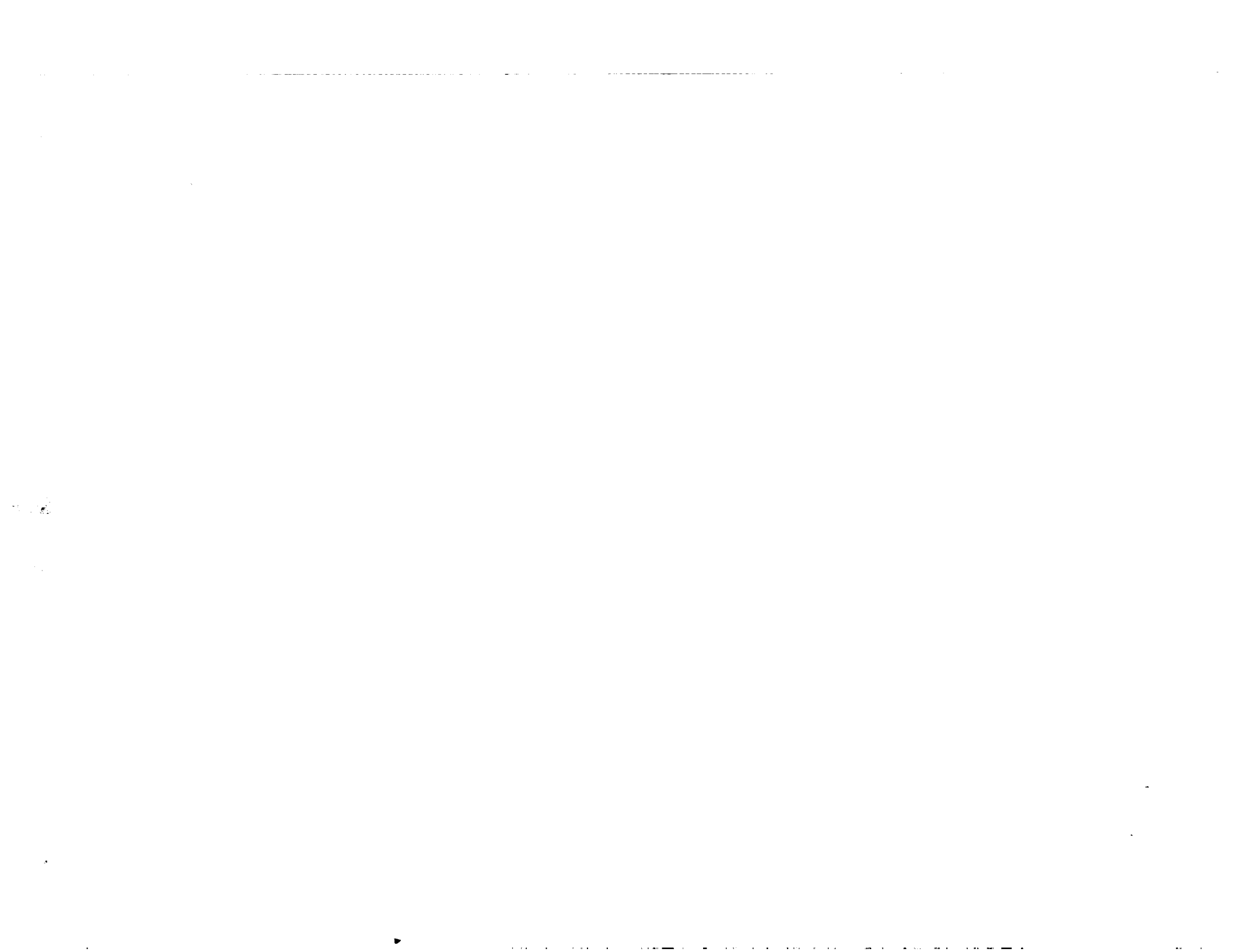
	Estimate	Lower Bound	Upper Bound
Drilling			
MODUs with annual inspections	198.0	172.4	198.0
Total number of inspections	379.0	133.5	624.5

Table I.6: 95-Percent Confidence Intervals for Gulf of Mexico Estimates in Table 3.1

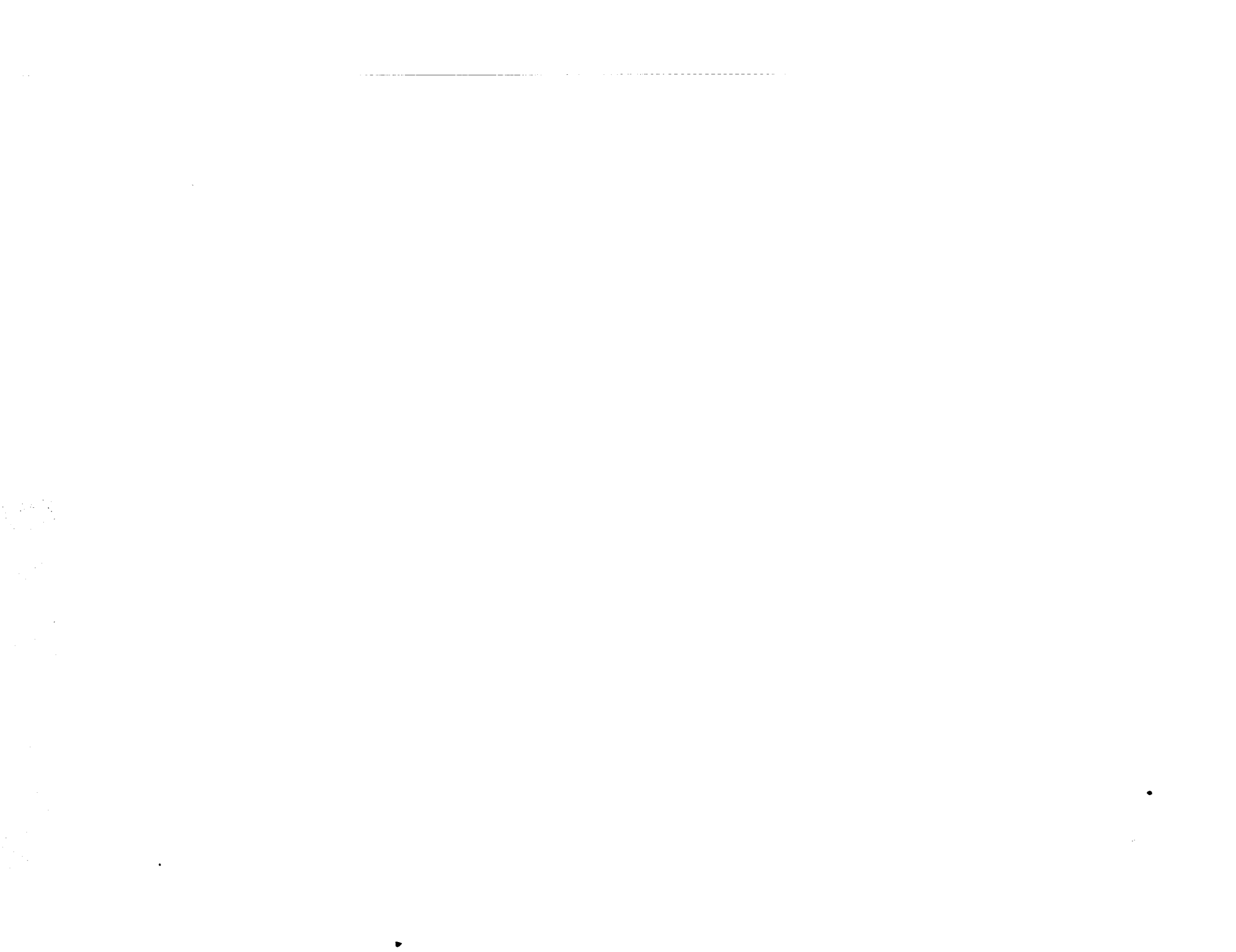
	Estimate	Lower Bound	Upper Bound
Production			
Inspections	3,591.8	3,559.1	3,624.6
Violations cited	4,790.1	3,822.8	5,757.5
Drilling			
Inspections	1,651.2	1,183.7	2,118.6
Violations cited	475.0	327.5	622.5

Table I.7: 95-Percent Confidence Intervals for Gulf of Mexico Estimates in Table 3.6

	Estimate	Lower Bound	Upper Bound
Production			
Inspections	1,840.6	1,829.5	1,851.7
Violations cited	2,012.1	1,845.3	2,178.8
Drilling			
Inspections	379.0	348.3	409.6
Violations cited	1,056.0	79.6	2,032.4







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