

GAO

Report to the Chairman, Committee on
Energy and Natural Resources, U.S.
Senate

August 1990

MINERAL REVENUES

Progress Has Been Slow in Verifying Offshore Oil and Gas Production



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**Resources, Community, and
Economic Development Division**

B-238152

August 31, 1990

The Honorable J. Bennett Johnston
Chairman, Committee on Energy
and Natural Resources
United States Senate

Dear Mr. Chairman:

This report responds to your request that we review the Department of the Interior's actions to (1) verify the accuracy of reported offshore oil and gas production and (2) annually inspect certain offshore lease sites. The **Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA)** (30 U.S.C. 1701 *et seq.*) requires Interior to establish a comprehensive system, including annual inspections of certain lease sites, to determine oil and gas royalties.

The federal government receives royalties from offshore oil and gas leases on the basis of the volume and price of the oil and gas production sold and the royalty rate. Therefore, it is essential that these elements be verified and that inspections be conducted to help ensure accurate determination of oil and gas royalties.²

Results in Brief

Seven years after passage of FOGRMA, Interior does not have a fully operational program for verifying that all oil and gas production is accurately reported for royalty determination purposes. However, its Minerals Management Service (MMS) recently initiated two programs intended to verify the accuracy of reported oil and gas production. Although neither program is fully implemented, results for the first 6 months indicate that the volume of oil produced, for the most part, has been accurately reported. Preliminary results of the pilot gas production verification program found minor volume discrepancies.

Although FOGRMA requires annual inspections of lease sites that have significant production or a history of noncompliance with applicable laws or regulations, MMS has not defined the terms and consequently has not determined which lease sites are subject to this inspection mandate.

¹For purposes of this report, we use the term "oil" to represent the liquid hydrocarbon substances of oil and condensate.

²For information on onshore production verification, see Mineral Revenues: Shortcomings in Onshore Federal Oil and Gas Production Verification (GAO/RCED-90-99, June 26, 1990).

While in 1989 MMS inspected over 98 percent of the locations where oil is measured, it inspected only about one-third of the meters where gas is measured. Because MMS has not determined which lease sites have significant production or a history of noncompliance and it maintains records by measurement point rather than lease site (a lease site may or may not have a measurement point), it has not demonstrated that it is meeting the FOGRMA inspection mandate.

Background

MMS, through its four regional offices and its Royalty Management Program in Lakewood, Colorado, is responsible for managing federal offshore oil and gas operations, including exploration, production, inspections, and revenue collection. From 1982 through 1989, reported production from federal offshore leases was 2.8 billion barrels of oil, valued at \$64.7 billion, and 34.1 trillion cubic feet of gas, valued at \$80.9 billion. This reported production earned the federal government \$23.8 billion in royalties.

Only MMS' Gulf of Mexico and Pacific regions have producing offshore leases. In 1989 production in the Gulf region accounted for 91 percent of oil royalties and 99 percent of gas royalties, while the Pacific region accounted for the remaining royalties. Gas royalties represent an increasing share of royalties from offshore production, rising from 54 percent in 1982 to 61 percent in 1989.

The amount of royalty is determined on the basis of the volume and price of oil and gas sold and the applicable royalty rate. For royalty purposes, the volume of oil and gas produced is measured by one or more meters at MMS-approved facility measurement points (FMPs), usually located at an offshore lease site. A single FMP can serve one or many leases. As of December 31, 1989, MMS' Gulf of Mexico region had 386 oil FMPs and 1,074 gas FMPs. The Pacific region had 10 oil FMPs and 9 gas FMPs. Run tickets are used to record the volume of oil that passes through a meter. Gas production is generally recorded on charts that graphically record temperature and pressure readings which are used to calculate the volume that passes through a meter. Each day's gas production is summarized on a gas volume statement.

MMS regulations require that oil meters be tested (proven) monthly and gas meters be tested (calibrated) at least every 45 days to ensure the

accuracy of the meters used to measure production.³ The lease operator is responsible for testing the oil and gas meters. This testing is performed by the operator, the transmission pipeline company, or a third party.

MMS regulations require offshore lease operators to submit oil run tickets and meter-proving reports to the appropriate MMS regional office. The run tickets and meter-proving reports are used to arrive at net volume—the volume on which royalties are determined. Offshore gas lease operators are not required to submit similar documents to regional offices, but must retain calibration reports.

In addition, operators submit monthly oil and gas production reports to the Royalty Management Program which identify the production volume and disposition (e.g., sales, storage) of the oil and gas. These reports are input to MMS' Production Accounting and Auditing System (PAAS). Not all production is subject to royalties. For example, in some cases, gas can legally be flared (burned off) without payment of royalties. Royalty payors submit monthly sales and royalty data to the Royalty Management Program which are input to MMS' Auditing and Financial System (AFS). MMS uses these automated systems to compare reported production sold with reported sales volume to identify potential royalty underpayment. This comparison does not verify production sold; the same correct or incorrect number can be reported to both systems.

In January 1982 the Commission on Fiscal Accountability of the Nation's Energy Resources (the Linowes Commission) reported that effective internal controls for the management of oil and gas royalties must include verification of production, sales, and royalties reported by companies. To verify production, the Commission recommended that federal royalty managers periodically obtain run tickets and other data on a sample basis and use them to cross-check production reports.

In January 1983 the Congress passed FOGRMA, which requires that Interior establish a comprehensive inspection, collection and fiscal and production accounting and auditing system to accurately determine oil and gas royalties. MMS stated that part of its comprehensive system consists of verifying reported offshore oil and gas production and conducting

³When an oil meter is proven, a meter factor is determined that shows the relationship between the true volume of oil passing through a meter and the volume indicated by the meter. The meter factor is used to mathematically adjust the production indicated by the meter. When calibrating a gas meter, a check is made to assure that the pressure and temperature recording devices are recording accurately.

production measurement and site security inspections. Although FOGRMA does not specifically require that Interior establish a production verification program, the act did, according to the MMS Director, provide "more urgency" to establishing a viable production verification program to ensure proper reporting of production volumes to PAAS.

In addition, FOGRMA requires annual inspections of each lease site that (1) produces or is expected to produce significant quantities of oil or gas in any one year or (2) has a history of noncompliance with applicable laws or regulations. The MMS Director noted that, to comply with the FOGRMA mandate, MMS conducts inspections of oil and gas meter facilities to ensure meter accuracy and site security requirements. FOGRMA defines a lease site as the land identified in the lease contract. A producing lease may or may not have an FMP—production from some leases flows to another location where it is measured, whereas production from other leases is measured at a meter on the lease site.

MMS conducts production measurement and site security inspections at FMPs. The oil production measurement inspections involve such things as examining components of the sales meter facility and sampling devices and examining how meter factors are determined. The production measurement part of a gas inspection involves checking the calibration frequency and flow rate of gas meters. The site security part of an inspection involves such items as examining seals that are placed on meters to preclude tampering and determining that no unapproved bypasses exist. MMS published regulations regarding site security for offshore operations in April 1988. In March 1990, MMS published proposed regulations clarifying that site security applies to gas as well as oil production. MMS expects to finalize these regulations by the end of 1990.

Progress Slow in Moving Toward Production Verification

Interior has been slow in implementing a program to verify offshore oil and gas production sold. In April 1984, we found that Interior had no assurance that oil produced from federal offshore leases was accurately measured for royalty determination purposes.⁴ We recommended that MMS implement plans for improved receipt and review of meter-proving reports and match these reports with run tickets on a selective basis. We also recommended that after PAAS and AFS became fully operational, MMS use the meter-proving and run ticket data in conjunction with PAAS to verify that reported sales volumes are accurate.

⁴Improvements Needed in the Department of the Interior's Measurement of Offshore Oil for Royalty Purposes (GAO/RCED-84-78, Apr. 30, 1984).

In October 1984 the Director, MMS, established a task force to compare run ticket net volumes with reported sales volumes. The study covered 8 months of production for 22 FMPs in the Gulf of Mexico region and 9 months of production for 1 FMP in the Pacific region. The task force found that there were discrepancies between the net volume on the run tickets and what was reported to MMS as having been sold and that there was a net underreporting of sales volumes. In December 1984 the task force recommended that, to ensure accurate royalty payments, run tickets for every offshore oil meter be compared with sales reported to AFS on a monthly basis.

MMS' Gulf of Mexico region conducted an extension of the 1984 study and looked at 111 oil FMPs for a 6-month period in 1985. The study compared reported sales volumes with run ticket net volumes. The study noted that underreported and overreported production totaled almost 1.4 million barrels, about 2 percent of the total net volume shown on the run tickets reviewed. The June 1986 report summarizing the study recommended that MMS develop an automated program, using run tickets, to verify volumes of oil on which royalty is due. This study served as the pilot for MMS' current oil verification program.

For the period January 1985 through March 1988, MMS' Pacific region manually calculated run ticket net volumes and compared them with production volumes reported to PAAS. According to regional officials most volume differences were due to rounding when making various calculations or to operators' bookkeeping errors. This effort was discontinued due to a staffing reassignment.

In a 1987 audit report, Interior's Office of Inspector General (IG) found that the MMS Gulf of Mexico regional office had not verified the accuracy of oil production volumes reported by lease operators, and neither the Gulf nor the Pacific regional office had verified volumes of natural gas produced and sold. The IG recommended that MMS implement (1) an automated process to verify oil production reported to PAAS and (2) a plan to randomly verify gas production reported to PAAS. In January 1987 MMS established a task force to develop procedures for verifying gas production. In its April 1988 final report, the task force recommended that gas production verification efforts be concentrated on validating quantities and qualities reported to MMS as sales.

Programs Underway to Verify Oil and Gas Production

MMS initiated two programs intended to verify production from offshore leases—one for oil and one for gas. As of July 1, 1990, the automated oil verification program included all FMPs in the Gulf region and none in the Pacific region due to computer problems. The gas verification program—a pilot program—is being conducted in the Gulf only. MMS plans to summarize the results of the gas program by October 1, 1990.

Oil Verification

The results of MMS' oil verification program in the Gulf for the first 6 months indicate that the volume of oil produced, for the most part, is being accurately reported.

In the Gulf of Mexico regional office, MMS inputs run ticket and meter-proving report data to a computer to derive a run ticket net volume that is compared with monthly production reports. Differences in volumes are forwarded to the Royalty Management Program for resolution. The Gulf region's first submission to the Royalty Management Program was in September 1989 with a review of May 1989 production data and included 37 FMPs. The program expanded to cover 303 FMPs beginning with October 1989 production data. As of July 1, 1990, the Gulf included all FMPs.

The first 6 months of production data that MMS reviewed (May-Oct. 1989) identified 90 volume discrepancies.⁵ Preliminary results, according to MMS officials, indicate that these discrepancies were generally the result of bookkeeping errors or late reporting of data. For example, MMS found that a company's underreporting for one FMP was offset by the same company's corresponding overreporting of production for another FMP. MMS believes that only three discrepancies resulted in actual underreported production and estimated that an additional \$25,000 in royalties may be due. MMS is in the process of working with the companies involved to resolve these discrepancies.

MMS' Pacific regional office initiated its automated oil verification program covering all 10 FMPs with January 1989 production data. However, the low tolerance level established by the region—a difference of more than 10 barrels—made the automated system very sensitive to small differences. The region decided, as an interim measure, to manually calculate run ticket net volumes as it had done in the past and compare them with volumes on production reports.

⁵A discrepancy in the Gulf of Mexico region is a difference of at least 1,000 barrels and 5 percent of the production reported.

Gas Verification

MMS' Gulf of Mexico regional office is conducting a pilot program to verify reported gas production. This program is being conducted on 48 FMPs (containing 106 of the Gulf's 1,814 gas meters) through which flow about one-third of Gulf gas production.

Because MMS regulations do not require gas operators to submit production documentation to the regional offices, the Gulf regional office, in order to conduct the pilot gas verification program, requested data from operators. In April 1989 MMS requested 6 months (Oct. 1988-Mar. 1989) of production documentation, including gas volume statements, for the 48 FMPs. MMS compared the volumes on the gas volume statements with the production reports sent to the Royalty Management Program. Preliminary results of the pilot gas program have found minor volume discrepancies.

MMS Needs to Determine Which Lease Sites Should Be Inspected Under FOGRMA

FOGRMA requires annual inspections of each lease site that produces or is expected to produce significant quantities of oil or gas or has a history of noncompliance with applicable laws or regulations. These phrases are not defined in the act, and MMS has not defined what constitutes significant production or a history of noncompliance. Although MMS has conducted inspections at some FMPs and/or meters, MMS has not demonstrated that it is meeting the FOGRMA inspection mandate.

MMS maintains inspection records by FMP and/or meter rather than lease site. An FMP can measure the production coming from more than one lease site or it can measure production from a single lease site. During calendar year 1989, the MMS Gulf region inspected almost all of the oil FMPs (379 of 386). However, it inspected less than one-third of the gas meters (578 of 1,814).⁶ In the Pacific region, MMS conducted production measurement and site security inspections at all 10 of the oil FMPs and 8 of the 9 gas FMPs.

According to MMS Gulf regional officials, the region inspected gas meters only if they were co-located with oil meters. These gas meters were not necessarily those through which passed the greatest amounts of production or those which had a history of noncompliance.

⁶MMS records indicate the number of gas meters inspected. Although MMS inspected 578 gas meters, some of these meters may have been inspected more than once. Hence the estimate that MMS inspected about one-third of the gas meters may be overstated.

Conclusions

Effective internal controls for the management of oil and gas royalties must include verification of production volumes reported by companies. We believe that oil and gas verification serves as a deterrent to inaccurate reporting of production. In addition, such verification is needed before PAAS data can reliably be compared with AFS data. As currently used, this comparison does not verify production; the same correct or incorrect number can be reported to both systems.

MMS has begun two production verification programs—one for oil and one for gas. We believe the steps MMS is taking regarding oil production verification—calculating net production volume from run tickets and meter-proving reports and comparing the results with operators' monthly production reports—are appropriate. MMS expects to complete its pilot gas production verification program by October 1990.

FOGRMA mandates that Interior annually inspect lease sites producing or expected to produce significant quantities of oil or gas or sites that have a history of noncompliance with laws or regulations. The MMS Director identified production measurement and site security inspections as those satisfying the FOGRMA inspection mandate. MMS conducted such inspections at some, but not all, oil and gas FMPs and/or meters, concentrating primarily on oil locations.

Because gas royalties represent the largest and a growing share of royalties from offshore production, we believe that it is increasingly important for MMS to perform production measurement and site security inspections at gas lease sites with significant production or a history of noncompliance. Further, because oil and gas lease sites with significant production or a history of noncompliance pose a greater potential royalty loss than other lease sites, it is important that MMS identify those lease sites so that appropriate priority can be given to ensuring that, as a minimum, those lease sites are inspected. This is especially important when resources are not sufficient to inspect all lease sites in a given year.

Recommendations

Because of the need to ensure that the volume of oil and gas produced from federal leases is accurately reported for purposes of determining royalties, we recommend that the Secretary of the Interior direct the Director, MMS, to take the following actions:

- Include the FMPs in the Pacific region in the automated oil verification program.

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- Complete the gas verification pilot program and move quickly to implement an ongoing production verification program. At a minimum, MMS should verify gas volumes for all high-producing leases and leases with a history of noncompliance, as well as randomly verify production from a sample of the remaining leases.
 - Define the terms "significant quantities of oil or gas" and "history of noncompliance" and ensure that lease sites meeting these criteria are annually inspected as required by FOGRMA.
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We obtained information for this report from officials in MMS regional offices in New Orleans, Louisiana, and Los Angeles, California; in the MMS Ventura, California, district office; in MMS' Royalty Management Program in Lakewood, Colorado; in the headquarters offices of MMS and the Office of the Solicitor in Washington, D.C. We reviewed offshore production documents, inspection reports, and agency pilot studies and analyzed computer statistics. In addition, we sent a letter of inquiry to MMS about its production verification and inspection responsibilities. After receiving the MMS response, we met with numerous MMS officials to clarify information in the response. We conducted our review from August 1989 through August 1990 in accordance with generally accepted government auditing standards. Our review did not address sales price and royalty rate which, together with production sold, is verified through Interior's royalty compliance audits.

As requested, we did not obtain official agency comments on this report. However, we discussed the factual information in a draft of this report with MMS headquarters officials. Although the MMS Director noted in a March 15, 1990, letter to us that MMS conducted production measurement and site security inspections to satisfy FOGRMA, the MMS headquarters officials said that FOGRMA imposes no additional inspection requirements on MMS. These officials said that under the Outer Continental Shelf Lands Act Amendments of 1978 (43 U.S.C. 1348) (OCSLAA), MMS is conducting annual inspections of all offshore facilities for safety and environmental purposes and that these inspections would also identify gross site security violations. They believe that these inspections also satisfy the FOGRMA inspection mandate. According to these officials, it is not necessary for MMS to identify the lease sites with high production or a history of noncompliance because the safety and environmental inspections are conducted at all facilities.

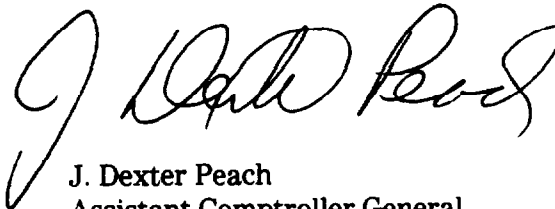
We believe that FOGRMA does impose additional inspection responsibilities on MMS. While we believe that production measurement and site

security could be performed in conjunction with the annual safety and environmental inspections that are done to satisfy OCSLAA requirements, the specific production measurement and site security inspection items identified by MMS are not covered in the annual safety and environmental inspections.

Unless you publicly announce the contents of the report earlier, we plan no further distribution until 30 days from the date of this letter. At that time, we will send copies to interested parties and make copies available to others upon request.

This work was performed under the direction of James Duffus III, Director, Natural Resources Management Issues, who can be reached at (202) 275-7756. Other major contributors to this report are listed in appendix I.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

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