Royalty Management Program's Auditing and Financial System: Technical Issues

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THE ROYALTY MANAGEMENT PROGRAM'S

AUDITING AND FINANCIAL SYSTEM:

TECHNICAL ISSUES

Background Paper

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THE ROYALTY MANAGEMENT PROGRAM'S AUDITING AND FINANCIAL SYSTEM: TECHNICAL ISSUES

A Background Paper Prepared by the
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SUMMARY

Royalty, rental, and bonus payments from oil and gas and other fuel and non-fuel mineral leases on public lands are a major source of income for the Federal government, States, and Indian Tribes. In 1989, Federal mineral revenue collections totalled over $3.9 billion, including over $2.9 billion from offshore bonuses, rentals, and *royalties;* and almost $1.0 billion from onshore and mineral leases and those on Indian lands. These receipts were disbursed to States, Indian Tribes and individual Indian allottees, the U.S. Treasury general fund, and designated Federal accounts.

Royalty management is very complicated due to the number, size, type, and interrelationships of leases, and the sales arrangements involved. Due to the large sums involved, the stewardship responsibilities for the States and Tribes, and the complexity of the task, the royalty management program has been watched closely by Federal auditors, disbursers, the minerals *industry*, public interest groups, and the press. For much of the program's history, that surveillance has led to reports of problems--including *mismanagement*, *Un*-dercollection, fraud, and theft.

In 1982, the Commission on Fiscal Accountability of the Nation's Energy Resources (the Linowes Commission) found that: 1) the U.S. Geological Survey (USGS-- then in charge of the program) did not verify data reported by companies, 2) the lease account records were so unreliable that the agency often did not know which companies had paid the royalties owed and which had not, 3) late payments were common, 4) lessee's records were seldom audited or

critically reviewed, and 5) the royalty management system lacked the basic internal controls needed to assure that oil and gas royalties were paid in full and on time.*

As a result of these and other findings, the Department of the Interior (DOI) transferred royalty management to the newly-created Minerals Management Service (MMS) and initiated a long-range automation effort. At the same time, Congress enacted the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA).[1] The Act required DOI to establish a comprehensive auditing, inspection, collection, enforcement, and fiscal and production accounting system for oil and gas leasing.

In 1983, however, the sorry state of royalties management again received a lot of publicity. Critics argued that the new program had been centralized and implemented much too rapidly. The principal target of criticism was MMS' Auditing and Financial System (AFS)--the primary system used to ensure accurate royalty reporting and payment on Federal and Indian leases. It was first automated in 1983 (after three years of development and testing) on three networked VAX minicomputers. It soon became apparent, however, that the volume and complexity of the workload would exceed the capability of the processing environment, and both the hardware and operating system were disasters. As a result, MMS sought and obtained funding to convert AFS from the minicomputers to an IBM 3081 mainframe computer. The contract for this conversion was awarded in 1985, and the system became operational in September 1987. It currently accounts for around 22,000 Federal and 4,000 Indian producing leases--mostly oil and gas.

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[1] P.L.97-451.

* Internal controls are a system of checks and balances that protect an organization's assets. Effective internal controls give reasonable assurance to management that no misstatement of accounts, either accidental or deliberate, is occurring.

Several startup problems had to be resolved in order for AFS to accomplish its tasks. First, many of the elements in the old royalty database were out of date or incorrect, and it had to be cleaned up and validated against the other lease and payor databases. An automated system was set up to compare the databases periodically. Second, the quality of monthly reporting also was poor. Initially, over 40 percent of the report lines submitted by payers were rejected by the system because they contained fatal errors or did not match reference data in the system. This required a new payor training program.

Although these and other initiatives resulted in dropping the input error rate to below 4 percent, in 1988 Congress and the DOI Office of the Inspector General (OIG) still considered inadequate accounting, collection, and disbursement of royalty payments to be a problem. A primary concern was that, although FOGRMA had established a comprehensive Federal system for royalty management in 1982, MMS had taken seven years to establish such a system. Moreover, there were lingering concerns about the adequacy of the AFS hardware and operating system. The Senate Committee on Energy and Natural Resources asked the Office of Technology Assessment (OTA) to examine these concerns.

OTA found that the current AFS hardware (IBM 3081 mainframe) and operating system remedy most of the problems that arose with the previous VAX minicomputer system. For the most part, the AFS operating environment is adequate for the size and complexity of the workload.

The principal remaining problems are data and software-related, primarily due to multiple data sets and data inconsistencies. While internal validation of the database, payor training, and other efforts have reduced the input error rate to 4 percent, the different databases and update files significantly reduce MMS' ability to ensure accurate royalty reporting and

disbursement. The various data integrity problems also increase the difficulty of reconciling data from its different sources, and the large amounts of redundant data mean high operating costs and slow processing.

In 1986, MMS began a system improvement effort plan which includes projects that will remedy these problems. They plan to eliminate three of the database updates currently in the system, aggregate the lease/agreement data for royalty management systems, and reduce redundant data storage. Not only would the planned improvements eliminate data integrity problems with system cross-checks, they would improve the audit and appeals processes. Over the long term, database integration also would provide a management information system for easier information retrieval and reporting.

A remaining concern about MMS' long-term plans is that the capacity of the IBM 3081 mainframe is expected to be exceeded around 1991. This coincides with the target date for completion of the system improvement plan. With the rapid advance in computing and operating system technology, it is possible that MMS could once again find itself having to convert to an entire new system, with the attendant delays in coming online and the resulting possibility that there would be yet another gap in accurate and timely royalty processing. Care should be exercised in the improvement of the operating system and in the choice of a larger computer to ensure that the system can be converted to the new technology without a loss in processing capability.

MMS recognizes these potential problems. There current acquisition plans call for IBM compatible equipment and operating systems that can run existing software without modification.

INTRODUCTION

The Federal government owns the mineral rights to large amounts of fossil fuel, metallic, fertilizer, and chemical minerals. The Mineral Leasing Act of 1920 and other laws authorize the Secretary of the Interior to issue prospecting permits and leases for exploration, development, and production of these minerals. Federal laws and regulations also establish rentals, royalties, and other conditions to ensure competition, diligent development, the highest use of the land, and payment to the public. As part of its trust responsibilities, the Department of the Interior (DOI) also administers the leasing program for, and collects royalties on, Indian mineral resources.

For each type of mineral lease, Federal laws and regulations specify the maximum allowable acreage, lease term, and rental and royalty rates. Rent is the amount the leaseholder pays periodically for the right to use the land or resources. Royalties are payment (in money or kind) of a share of production to ensure a fair return to the Nation for the use of its mineral resources. Royalties may be an established minimum, or on a sliding or step scale.* Successful bidders for mineral leases also pay a bonus as consideration for the lease.

Royalty, rental, and bonus payments from oil and gas and other fuel and non-fuel minerals produced from public lands are a major source of income for the Federal government, States, and Indian Tribes.** In 1989, Federal miner-

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* A sliding-scale rate is based on average production and applies to all production. A step-scale rate increases by steps as the average production increases. Minerals Management Service(MMS), Mineral Revenues: The 1986 Report on Receipts from Federal and Indian Leases (Washington, DC: U.S. Department of the Interior 1987).

"* Under the Minerals Leasing Act of 1920, States receive payments equal to one-half of the royalties for mineral resources produced on Federal lands within their borders (Alaska gets 90 percent). Indian tribes and allottees receive 100 percent of the royalties.

al revenue collections totalled $3.9 billion, including over $2.9 billion from offshore bonuses, rentals, and royalties, and almost $1.0 billion from onshore mineral leases and those on Indian lands (see table 1).[2] These receipts were disbursed to States, Indian Tribes and individual Indian allottees, the U.S. Treasury general fund, and designated Federal accounts (see table 2).

Table 1. --FY 1989 Mineral Revenue Collections
(thousands)

Offshore Federal Revenues:	
Royalties and minimum royalties	$2,061,666
Rents and bonuses	867,545
Subtotal	$2,929,211
Onshore Federal Revenues:	
Royalties and minimum royalties	$ 733,915
Rents and bonuses	127,285
Subtotal	$ 861,200
Indian and Tribal Land Revenues:	
Royalties and minimum royalties	$ 120,339
Rents and bonuses	1,615
Subtotal	$ 121,954
Total royalties and minimum royalties	$2,915,920
Total rents and bonuses	996,445
Total	$3,912,365

SOURCE: U.S. Department of the Interior, Minerals Management Service, "Monthly Activity.Report: September 1989"

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[2]Data provided to OTA by MMS.

Table 2. --Mineral Lease Revenue Disbursements, FY 1989
(thousands)

Offshore Federal Revenues:	
Historic Preservation Fund	$ 150,000
Land & Water Conservation Fund	862,761
U.S. Treasury	1.917.898
Subtotal	$2,930,659
Onshore Federal Revenues:	
Reclamation Fund	$ 337,865
State Shares*	433,422
U.S. Treasury	89.913
Subtotal	$ 861,200
Indian Disbursements:	
Tribes and Allottees	$ 121,954
TOTAL	$3,913,813

SOURCE: U.S. Department of the Interior, Minerals Management Service, "Monthly Activity Report: September 1989."

Within DOI, the Minerals Management Service (MMS) is responsible for administering the Royalty Management Program (RMP) . The current RMP mission is:

> Ensure that all revenues from Federal and Indian mineral leases are efficiently, effectively, and accurately collected, accounted for, verified, and disbursed to the appropriate recipients in a timely manner and in accordance with existing laws, regulations, lease terms, orders, and notices; and provide support for technical lease management functions.[3]

[3]U.S. Department of the Interior Minerals Management Service, Management Action Plan for the Royalty Management Program (Washington, DC: U.S. Government Printing Offlce, April 1985).

• 29 States in 1989: Wyoming--37%; New Mexico-21%; Utah–8%; Colorado--8%; California-6%; Montana-5%; Louisiana-3%; Nevada-2%; Alaska-2%; Arkansas-2%; North Dakota-l%; and 18 other States sharing the remainder.

This mission is very complicated due to the number, size, type, and interrelationships of leases, and the sales arrangements involved. Calculating the royalty owed on the value of production from a lease involves computation of product quantity and quality (sometimes for multiple products), value, and processing and transportation allowances. A lease may have more than one owner and the products may be sold to more than one purchaser at a variety of prices. Production from a group of leases may be allocated to individual leases by agreement; these can involve combinations of Federal, Indian, State, and private lands.[4] In 1989, MMS had accounting responsibility for over 93,000 mineral leases (see table 3). There were around 19,000 Federal and 4,200 Indian leases producing; they involved about 80,000 different combinations of leases, products, and selling arrangements.

Table 3.--Mineral Leases as of September 30,1989

Lease category	Producing	Nonproducing	Total
Onshore	18,969	63,295	82,264
Indian	4,250	78	4,328
Offshore	1,567	5,018	6.585
Total	24,786	68,391	93,177

SOURCE: U.S. Department of the Interior, Minerals Management Service, "Monthly Activity Report: September, 1989.

[4] Statement of William D. Bettenberg, Director Minerals Management Service, before the Senate Energy and Natural Resources Committee, Subcommittee on Mineral Resources Development and Production, May 23, 1988.

Another factor complicating royalties is that many payers must estimate the amount due because actual volumes and prices are unavailable by the reporting date. Transportation and processing allowances also are normally based on estimates. The royalties and allowances due must then be adjusted when actual volumes, prices, and allowances become available. Finally, a substantial portion of mineral production is sold at less than arms-length, and values placed on intra-company transfers may not reflect market values.[5]

The magnitude of the funds, the stewardship responsibilities, and the complexity of the task make royalty management highly visible. The resulting scrutiny has led to reports of problems--including mismanagement, undercollection, fraud, and theft.* Most recently, these led to a series of Audit Reports prepared by the DOI Inspector General's Office,[6] Concerns raised in those reports about the automated systems MMS uses to account for and disburse royalties led the Senate Committee on Energy- and Natural Resources to ask the Office of Technology Assessment (OTA) to undertake a study of the technological opportunities for improving royalty collection to ensure that revenues do not fall short.

This memo responds to that request. It begins with a brief history of royalty management within the Federal government, and the reported problems with it. It then describes the current RMP, including the automated systems

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[5] Ibid.

[6] U.S. Department of the Interior Office of Inspector General Audit Report: Mission Accomplishment. Valuation and Standards Division, E-LM-MMS-07-87A Report No.88-59, March 1988; Audit Report: Mission Accomplishment, Fiscal Accounting Division, E-LM-MMS-07-87B, Report No. 88-61, April 1988; Memorandum Audit Report: Mission Accomplishment, Production Accounting Division, E-LM-MMS-07-87C, Report No. 8842, April 1988; Audit Report: Mission Accomplishment, Royalty Compliance Division, E-LM-MMS-08-87E, Report No. 88-63.

* A partial listing of reports and articles about problems with royalty management may be found in the Bibliography to this memo.

used to account for royalties. Focusing narrowly on the Auditing and Financial System (AFS), the memo discusses the remaining problems with the automated system and MMS' efforts to resolve them.

Because this memo is limited to the technical aspects of the AFS, it does not discuss the underlying accounting rules. Ongoing efforts by the U.S. General Accounting Office will examine the accounting rules and practices in detail. Nor did OTA examine issues related to the accuracy or timeliness of disbursements to States and Tribes, auditing practices or enforcement measures, paperwork and reporting requirements, or MMS' estimates of the amount that will be saved as a result of their planned AFS improvements.

BACKGROUND

The Department of the Interior has been collecting bonuses, rents, royalties, and other receipts from Federal and Indian mineral leases since 1921. *The* U.S. Geological Survey's Conservation Division was responsible for managing the royalty program from 1926 to 1982. Criticisms of their collection, accounting, and disbursement had circulated for decades. In the late 1970s, partly in response to those criticisms and partly due to the growth in the scope of their mission,* the Conservation Division began designing a new computerized royalty management system. The target date for implementng the first phase of the new system (the Auditing and Financial System) was January 1983. Phase Two- -the Production Accounting and Auditing System--had a target startup date of January 1984.[7]

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7 U.S. Department of the Interior (DOI), Report of the Commission on Fiscal Accountability of the Nation's Energy Resources, D. Linowes, Chairman, January 21, 1982.

* Royalties increased from $123 million in 1960 to more than $4 billion in 1981.

In 1981, however, criticisms of the program began to receive a lot of publicity, with journalists alleging that theft and fraud were widespread.[8] In May 1981, preliminary drafts of a GAO report, *Oil and Gas Royalty Collections- -Longstanding Problems Costing Millions,* circulated within the government. GAO cited mismanagement, maintenance of an obsolete accounting system, and failure to collect all royalties due the Federal government. This was the sixth GAO report criticizing the program in 22 years. Moreover, between 1969 and 1977, the DOI Inspector General had issued five similar reports.[9] In July 1981, the media openly blamed the Federal government for mismanagement, and admonished the oil and gas industry for greed and corruption.l" These charges led to investigations, proposals for reform, and lawsuits.'

On July 8, 1981, the Secretary of the Interior established the Commission on Fiscal Accountability of the Nation's Energy Resources (the Linowes Commission). Its charter was to examine allegations of massive irregularities in royalty payments, to investigate charges of oil theft from Federal and Indian lands, and to make recommendations for improving fiscal accountability of

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8 See, e.g., Los Angeles Times, Jan. 12, 1981, sec. 4, p. 1; Los Angeles Times, Jan. 15, 1981, sec. 4, p. 1; Washington Post, Feb. 1, 1981, p. A17; Los Angeles Times, Mar. 21, 1981, sec. 3, p. 18; New York Times, Apr. 4, 1981, p. 7; CBS News, 60 Minutes, vol. XIII, no. 30, April 12, 1981; New York Times April 15, 1981, p. A26.

9 Russell Davis, James E. Wilen, and Rosemarie Jergovic, "Oil and Gas Royalty Recovery Policy on Federal and Indian Lands," Natural Resources Journal, vol. 23, no. 2, April 1983.

10 Washington Post, July 2, 1981, p. B17.

• Between February and August 1981, the Senate Select Committee on Indian Affairs held four hearings on Federal supervision of oil and gas leases on Indian lands. In August 1981, the Senate Energy and Natural Resources Committee met on the collection, accounting, and disbursement of Federal and Indian mineral royalties. In April 1981, the House Committee on Government Operations, Subcommittee on Commerce, Consumer, and Monetary Affairs, held hearings on USGS oil and gas royalty collection practices. Between September and December 1981, the House Interior and Insular Affairs Committee, Subcommittees on Oversight and Investigations and on Mines and Mining, convened three joint hearings on royalty management. In the Spring of 1981, the Western Attorney Generals Association, the Interstate Oil Compact Commission, and the Western States Land Commissioners Association sent resolutions to the Secretary of the Interior urging upgrading of the minerals management system and look-back audits of royalty accounts. In May 1981, the State of California (joined by ten other States) filed suit alleging that significant royalty looses were occurring due to DOI's failure to discharge its responsibility to collect all royalties due. Davis et al, supra note 4.

the Nation's energy resources. On January 21, 1982, the Commission submitted its report, which stated that 'management of the Nation's energy resources has been a failure for more than 20 years."11

The Commission found the major shortcomings of the USGS royalty management system to be: 1) the USGS did not verify data reported by companies, 2) the lease account records were so unreliable that the agency often did not know which companies had paid the royalties owed and which had not,* 3) late payments were common, 4) lessee's records were seldom audited or critically reviewed, and 5) penalties for underpayment scarcely existed.12

The Commission also found that the USGS system lacked the basic internal controls needed to assure that oil and gas royalties were paid in full and on time. Internal controls are a system of checks and balances that protect an organization's assets. Effective internal controls give reasonable assurance to management that no misstatement of accounts, either accidental or deliberate, is occurring. According to the Commission's report, internal controls built into the royalty management system should assure that Federal managers have a record of new production as soon as it begins; show accurately royalties paid and due, and who is responsible for payment; obtain enough information to allow Federal managers to verify company statements concerning amounts produced, amounts of products sold, and their value; and provide adequate penalties to enforce requirements for accurate and timely reporting.

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11 DOI, supra note 7.

12 Ibid.

* Of 26,769 total accounts, 19,487 had balances in 1980, about equally divided between under- and overpayments. But the balances in either direction were mostly erroneous, and USGS considered them worthless for determining who owes what when. DOI, supra note 6.

Because USGS recordkeeping was in such disarray, the Comission could not determine the exact amount of underpayments. The results of individual audits suggested, however, that hundreds of millions of dollars (7-10 percent of annual obligations) went uncollected every year.[13]

Finally, the Commission's report expressed concern about USGS' ability to design and implement the new royalty management system on schedule. The Commission believed that Phase One, which was intended to improve recordkeeping and incorporate internal controls to identify and keep track of payers, was too complex to be completed on time. The report recommended that parts of the Auditing and Financial System be tested manually before proceeding to automation. It also expressed doubts about the complexity and lack of pretesting of Phase Two, which would include system cross-checks on production data.

On January 19, 1982, the Secretary of the Interior replaced the USGS Conservation Division with MMS. That reorganization (and other reforms instituted at the same time) was based both on the Commission's findings and on the Secretary's perception that large royalty losses were occurring.[14]

The second response to the Commission's findings was legislative--the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA) .15 The purposes of FOGRMA were to clarify and expand the authorities and responsibilities of the Secretary of the Interior in managing the Federal oil and gas royalty accounting system, to require the development and implementation of enforcement practices, and to utilize the capabilities of States and Indian tribes in the Federal royalty management system. Among other things, the Act requires:

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13 Ibid.

14 Davis et al, supra note 9.

15 P.L.97-451.

- DOI to establish a comprehensive auditing, inspection, collection, and fiscal and production accounting system for oil and gas leasing;
- lessees and interest holders to make royalty payments;
- lessees and interest holders to notify the Secretary of the transfer of any lease interest or obligation;
- lessees and interest holders to maintain records for 6 years;
- DOI to disburse royalties to States monthly and to Tribes at least monthly;
- DOI to provide a description and accounting of payments to States and Tribes;
- payers to pay interest on late royalty payments or underpayments at the Internal Revenue Service rate; and
- DOI to pay interest on late disbursements to States and Tribes.

Both FOGRMA and the Outer Continental Shelf Lands Act Amendments of 1978 (OCSLA) include reporting requirements. FOGRMA required the Secretary of the Interior to develop an annual report format following consultations with the House Committee on Interior and Insular Affairs and the Senate Committee on Energy and Natural Resources. The current format addresses 6 topics: RMP accomplishments; mineral revenue collections, escrow release, and disbursements; auditing activities; inspections and enforcement; organizations, functions, and structure; and status of the Linowes Commission recommendations. OCSLA requires the Secretary to report every 2 years on delinquent oil and gas royalty accounts on Federal lands, and on auditing and accounting procedures implemented to assure accurate and timely payment or royalties.

Following the MMS reorganization and passage of FOGRMA, DOI continued to emphasize automating its various tasks in order to provide adequate accounting for royalties. They developed the Auditing and Financial System (AFS) to ac-

count for and distribute royalties from producing or producible Federal onshore and Indian leases and all offshore leases. It was automated in 1983 (after three years of development and testing) on three networked VAX minicomputers. It soon became apparent, however, that the volume and complexity of the workload would exceed the capability of the processing environment. [16]

In 1983, there was again a lot of publicity on the sorry state of royalties management. Critics argued that the system had been centralized and implemented much too rapidly. The RMP had consolidated and moved to Denver, hired new staff, chosen and installed the computer system, and brought all regions online in about 12-18 months total. Both the hardware and operating system were disasters. The system lacked flexibility and was not user-friendly. The three machines could only be synchronized once a week, and corrections could not be made online. It took 5 minutes to get a screen record up (if the system wasn't down, which it was frequently). Also, the system could not handle discrepancies between payer information in the database and the monthly reports. When they occurred, it reported no payment.[17]

MMS sought and obtained funding to convert AFS from the minicomputers to a mainframe computer. The contract for this conversion was awarded in 1985, and the system became operational in September 1987.

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16 Bettenberg, supra note 4.

17 William D. Bettenberg, Director, MMS, personal communication to OTA, September 1988.

The second automated element, the Bonus and Rental Accounting support System (BRASS), accounts for and distributes annual rentals from around 61,000 nonproducing onshore Federal leases. This function was historically the responsibility of the Bureau of Land Management (BLM). It was transferred to MMS in 1983 and became operational on one VAX minicomputer in 1984.[18]

The Production Accounting and Auditing System (PAAS) maintains production data for all on- and offshore leases. PAAS also provides a cross-check with sales data reported to AFS, and generates exceptions when discrepancies are found.[19] PAAS has been operational for offshore and solid mineral leases since 1985, and for all onshore leases since October 1989.

18 Bettenberg, supra note 4,

19 Ibid.

THE ROYALTY MANAGEMENT PROGRAM

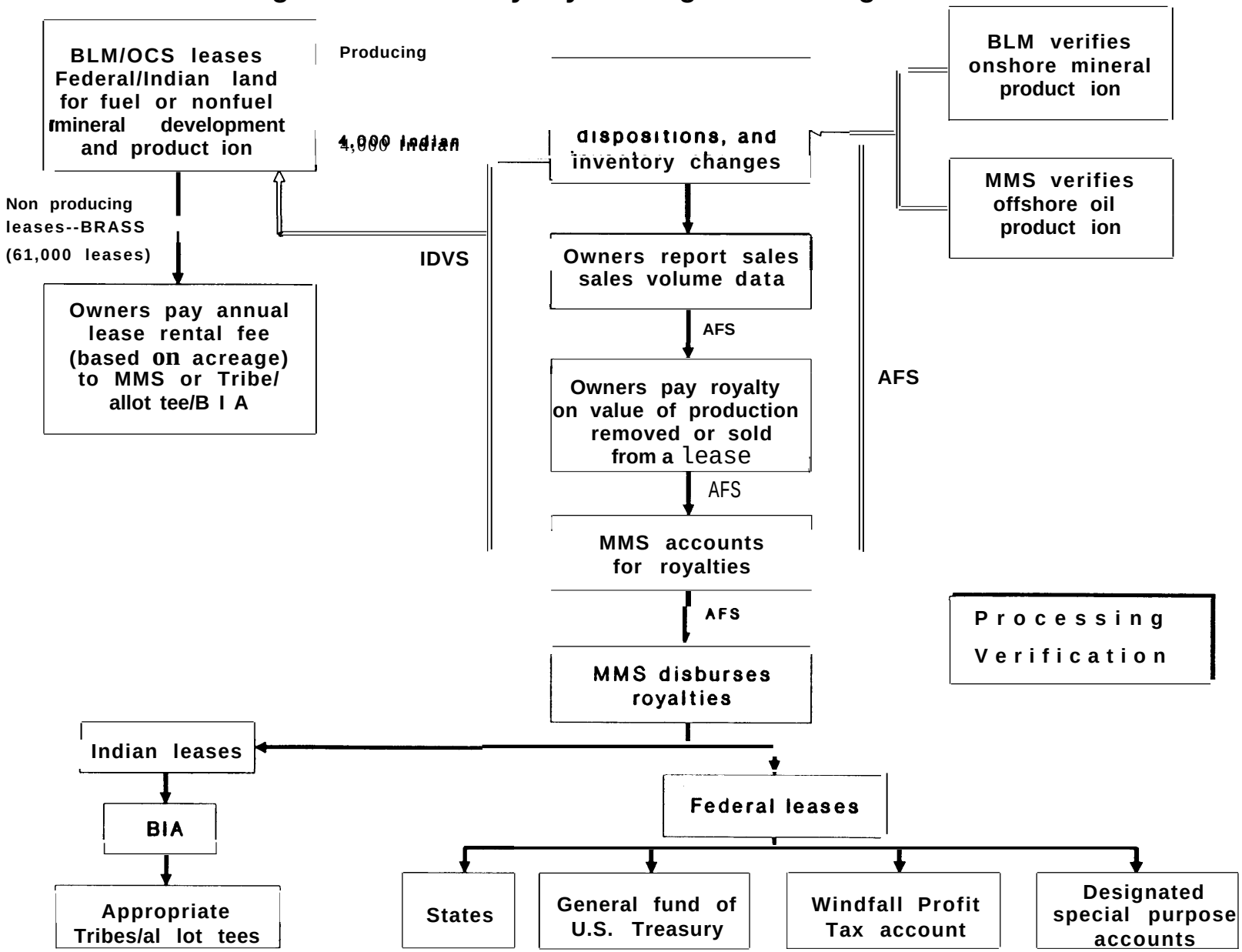
Figure 1 provides an overview of the royalty management program. The Bureau of Land Management leases mineral development and production rights on Federal and Indian lands. Owners of producing leases pay royalties monthly on the value of production removed or sold from a lease. An annual lease rental is paid on nonproducing leases. The Royalty Management Program keeps track of leases, collects and accounts for bonus payments, royalties, and rentals, and disburses the funds to the appropriate Federal, State, and Indian accounts. Box A lists the automated elements of the royalty management process.

Within RMP, the Auditing and Financial System (AFS) is the primary system used to ensure accurate royalty reporting and payment on Federal and Indian leases. AFS accounts for and distributes royalties from producing or producible Federal onshore and Indian leases and all offshore leases. Since September 1987, it has operated on an IBM 3081 mainframe computer. It currently accounts for over 20,000 Federal and 4,000 Indian producing leases--mostly oil and gas.

AFS was designed to fulfill eight principal objectives:

1. Process royalties reported by payers promptly and efficiently.
2. Distribute mineral revenues to States, Indians, and Treasury accounts on a monthly basis in accordance with FOGRMA.
3. Calculate, distribute, and disburse interest and penalty payments to States and Indians where required by FOGRMA.
4. Identify, using data provided by payers, under-reporting and nonreporting to enable MMS to collect revenues due promptly.

Figure I.--The Royalty Management Program



Box A. --The Elements of the Royalty Management Process

Auditing and Financial System (AFS). The RMP automated fiscal accounting system that accounts for royalties collected from Federal and Indian leases, as reported and paid by lease owners.

Automated Inspection Record System (AIRS). A BLM system that includes data on the status of wells, such as producing or shut-in.

Automated Lease Management Records System (ALMRS). This BLM system maintains key data on all onshore Federal leases, both producing and non-producing. It comprises the data in AFS and BRASS.

Bonus and Rental Accounting Support System (BRASS). The RMP automated system of the RMP that accounts for rentals from non-producing Federal leases.

Interagency Data Verification System (IDVS). An automated system used to compare BLM and MMS databases on a periodic basis.

Production Accounting and Auditing System (PAAS). The RMP automated production accounting system that accounts for all volumes produced, used, and sold from Federal and Indian leases, as reported by lease operators.

State and Tribal Support System (STATSS). This system provides access to AFS data via terminals and remote personal computers through a series of online computer screens and financial reports.

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5. Account for all mineral revenues due, collected, and disbursed in a system of accounts that enhances MMS' ability to control and report on the RMP.

6. Provide royalty accounting and statistical information to States, Indians, and other parties.

7. Build and maintain a database that can effectively be matched with production data in PAAS.

8. Create an automated billing process for all receivables generated by the system.[20]

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20 U.S. Congress, General Accounting Office, Indian Royalties: Interior has not Solved Indian Oil and Gas Royalty Payment Problems (Washington, DC: U.S. Government Printing Office, GAO/IMTEC-86-13, March 1986).

The owners of leases report sales volume data (including the price at which minerals are sold) to MMS every month. Using AFS, MMS accounts for the royalties and disburses them. Royalties on Indian leases are paid to the Bureau of Indian Affairs, which distributes them to the appropriate Tribes or individual allottees. Royalties on Federal leases are distributed to the States, the general fund of the U.S. Treasury, the Windfall Profit Tax Account, and designated special purpose accounts. '

AFS verifies its accounting and disbursement through cross-checks with other databases and through internal reporting/payment comparisons. The primary cross-check is with the Production Accounting and Auditing System (PAAS) --a database of operators' reports on production volumes, dispositions, and inventory changes. PAAs is designed as an extension of AFS. Based on data provided by lease operators (who often are different from owners), PAAS identifies the amount of production that should be reported to AFS as sold. Sales volumes reported by owners to AFS should match operators' reports to PAAS. The two systems were designed so that data would be compared regularly to identify instances of under-reporting, over-reporting, and nonreporting.[21]

The automated Interagency Data Verification System (IDVS) also compares BLM and MMS databases periodically. AFS data also are cross-checked with the BLM/OCS databases on onshore and offshore leases. Finally, BLM and MMS audit operations to ensure that operators' and owners' reports are correct.[22]

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21 Bettenberg, supra note 4.

22 Ibid.

AFS also performs a function called exception processing to detect late payments and certain types of underpayment. Exception processing compares what a payor reports and pays to what the system expects the payor to report and pay. Where there are discrepancies, AFS generates billable exceptions. PAAS also generates exceptions if production data differ from sales data.[23]

The State and Tribal Support System (STATSS) provides access to AFS data via terminals and remote personal computers through a series of online computer screens and financial reports.

IMPLEMENTATION OF AFS

Several startup problems had to be resolved in order for AFS to accomplish its tasks. First, many of the elements in the old royalty database were out of date or incorrect. The quality of monthly reporting also was poor. Initially, over 40 percent of the report lines submitted by payers were rejected by the system because they contained fatal errors or did not match reference data in the system. To overcome these problems, RMP undertook several initiatives:

- payor training, a revised payor handbook, preprinted report forms, and charges for reporting errors;
- internal validation of the AFS database against BLM, BIA, State and Tribal data sources; and
- design and implementation of an automated system (IDVS) to compare BLM and MMS databases on a periodic basis.[24]

These initiatives dropped the input error rate to below 4 percent.

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23 Ibid.

24 Ibid.

After installing the new mainframe, MMS also began a systems improvement effort to identify and implement needed improvements. In April 1985, MMS published a Management Action Plan for improving the RMP which incorporated elements related to policy, management, systems, and external involvement. These included cleaning up the AFS Reference Database and switching to the mainframe, which was sized to accept RMP's current workload and expected growth during its service life. The benefits of the new system were expected to be:

- improved accountability and auditability of payment receipt and disbursement,
- improved ability to generate reports explaining royalty processing,
- direct online access to data and the ability to update the database interactively,
- improved ability to process royalty payments in a timely reamer,
- substantial reduction in operational risk with greater assured performance,
- improved ability to establish routine automated comparisons with other databases to ensure a complete lease universe,
- improved ability to automate substantial portions of database changes, and
- capability to use full functionality of the software, especially exceptions processing, which is expected to generate additional royalty.[25]

In November 1986, RMP began an effort to identify, design and implement needed system and program improvements using the IBM Business Systems Planning and Implementation (BSPI) methodology. BSPI is designed to develop

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25 DOI, supra note 3.

applications and databases that support organizational objectives. The major RMP management objectives were to move money faster, simplify industry reporting requirements, improve clientele relations, use resources more efficiently, minimize duplication of data collection, and better utilize and validate data collected or shared by RMP.[26]

Phase I of that effort (completed in November 1987), conducted with significant consultation with States, Tribes, and industry, proposed 59 improvements and provided a framework to guide future systems development. Table 4 lists the proposed improvements and indicates their status as of August 1988. The team chose 5 policy/regulatory projects and 14 system projects (encompassing 34 of the 59 proposed improvements) to be implemented over the following 3 years at an estimated cost of $5.7 million.[27] Three of the recommendations were later determined to be infeasible; the remaining 22 were either completed or underway by August 1988, when the Business System Improvement Plan (see below) was published. Table 5 shows the planned system improvements affecting AFS and the management goals they would further.

The MMS schedule for implementing these projects reflects the fact that some are dependent on the completion of others; i.e., some tasks use data and data relationships established in preceding projects. Therefore, database improvement tasks are first on RMP's schedule. Also, each project will be divided into several software releases so that benefits can be realized as soon as possible. New software is being combined with innovations in normal operations and maintenance to ensure integrated testing.[28]

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[26] U.S. Department of the Interior, Minerals Management Service, Business System Improvement Plan (Washington, DC: U.S. Department of the Interior, August 1988).

[27] Ibid.

[2a] Ibid.

Table 4.--Business System Plan Recommendations

Recommendation	System or nonsystem	Completed or underway	Not feasible
Package 1:			
1. Revenue source level reporting	N		
2. Eliminate zero sales		X	
3. 90-day adjustments for unit/comm		X	
4. Gas estimates at revenue source	S		
5. Payor calculated interest			x
6. Unit/comm agreement reporting	S		
7. Payor calculated and reported WPT	N		
8. Automated reference data reporting		x	
9. Combine manual & tape reports before EP	S		
Package 2:			
1. Establish interest-bearing escrow account	N		
2. Interest on receipt of cash	S		
3. Account for cash w/o report	S		
4. Write-off small mismatches	S		
5. Cash/report reconciliation		x	
6. Disburse partially paid bill		x	
7. Disburse audit payments before report	S		
8. Document disbursement policy	N		
9. AFS D/D similar to BRASS	S		
Package 3:			
1. Eliminate non-respondent EP		x	
2. Automate EP for rent, minimum royalty, etc.	S		
3. Oil price database and comparisons	S		
4. Gas price database and comparisons	S		
5. Allowance database and comparisons	S		
6. Monitor adjustments to audited leases		x	
7. Perform onshore prod/sales comparisons			
8. Release accepted parts of bills to EP			x
9. Notify reporters when PAAS exception resolved		x	
10. More billing data to reporters	S		
11. Identify chronic adjusters	S		
Package 4:			
1. Perform audits on a payor basis		x	
2. Target audits on major payors		x	
3. Use system data to target audit candidates		x	
4. Approve section 10 recoupments		x	
5. Reevaluate resident audit program		x	

Recommendation	System or nonsystem	Completed or underway	Not feasible
Package 5:			
1. Time-specific process for bill follow-up	S		
2. PAAS late and missing report assessments		X	
3. Consolidate penalty issuance	N		
4. Establish civil penalty thresholds		X	
5. Associate Director issue civil penalties	N		
Package 6:			
1. Modify section 10	N		
2. Legislative for leasable solid minerals	N		
3. Delegated audit authority for solids/geothermal	N		
Package 7:			
1. Establish strategic planning process	N		
2. Establish policy document	N		
3. Include production data in STATSS	S		
4. Develop production history report		x	
5. Correct EOP royalty rate and unit value			
6. Develop MIS	S	x	
7. Conduct annual internal control reviews			
8. Automate internal controls	S		
9. Archive at document level			x
10. Disseminate policy changes		x	
Package 8:			
1. Modify BIA/BLM/MMS MOU on nonstandard leases		x	
2. Nonstandard revenue and production reporting	S		
3. Nonstandard production/sales comparisons		x	
4. Nonstandard production/sales on STATSS	S		
5. Revenue and cost acctg. nonstandard lease	S		
Package 9:			
1. Limit adjustment to six-year period	N		
2. Verify adjustments to original data	S		

Table 5.--Goals of AFS System Improvement Projects

PROJECT	VALUE* (million dollars)	REVENUE			SYSTEM & DATA				
		Generate additional revenue	Improve exception processing	Improve audit trails	Reduce data redundancy	Increase data consistency	Increase flexibility to respond to change	Conserve system capacity	Facilitate future expansion/ automation
Lease/agreement database enhancement	$1.23			X	X	X	X	X	X
Financial system enhancement	($0.11)			X	X			X	X
Product valuation & allowance monitoring	$9.58	X	X						
Combine manual and tape reports	($0.09)		X						
Expedite audit bill disbursement	$0.13			X					
Exception processing enhancement	$1.71		X	X			X		
Appeals database	$0.04					X		X	
Business information system	$0.56				X	X		X	
Adjustment line monitoring	$1.28	X							
Bill follow-up	$0.16	X							
Systems integration	$1.09				X	X	X	X	
Audit support	$3.71	X		X					

* This is the cumulative net present value over a 6-year period, which is calculated by determining first, the annual net benefit (annual benefit - annual cost), then calculating the annual net present value benefit and summing it over 6 years.

PROJECT	STAFF & MANAGEMENT				PUBLIC REL	
	Reduce data processing	Enhance query ability	nh nc reporting ability	Increase staff productivity	Simplify payor reporting	Impro payo relati
Lease/agreement database nh ncement	×	X	X	X	×	×
Financial system enhancement	×	X	X	X		
Product valuation & al nc mo toring	×	X		X		
Combine manual and tape reports		X		X	×	×
Expedite audit bil disbursement	X			X	×	
Exception processing enhancement	X	×		X		×
Appeals database	X	×	X	X		
Business information system	X	×	X	X		
Adjustment line mo toring						
Bill follow-up	×			X		
Systems integration	×	×	X	X		
Audit support	×	×		X		

One of SIT's major objectives was to develop projects that would lead to consistency of information throughout RMP. They found that different RMP units did not agree about the definitions and meanings of data fields, and that the same field was structured differently in the various database systems (different field lengths, different code structure, etc.). Records with the same key also were structured differently in the various systems. Moreover, data were processed and updated daily, weekly, monthly, or interactively, giving different values to different copies of the data. Finally, the processing and update rules were different for the various copies of the data.

PLANNED AFS SYSTEM-RELATED IMPROVEMENTS[29]

Lease/agreement Database Enhancement

This project automates data transfer between BLM and MMS; it is scheduled for completion during FY89-90. Currently, AFS, BRASS, and PMS all maintain lease/agreement data. AFS accepts Payor Information Forms (PIFs) from payers and maintains this in its database. PMS runs a comparison against AFS lease/agreement data and converts data to the PAAS onshore and offshore databases. BRASS receives lease information from BLM and stores it in its lease database. When a lease starts producing, BRASS lease data are entered manually into AFS, augmented by data from BLM. STATSS also provides inquiry access to the lease/agreement data. PAAS onshore also receives lease/agreement data from BLM, which sometimes identifies data inconsistent with RMP data. When corrected, these data are passed back to AFS to maintain data integrity.

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[29] Unless noted otherwise, the material in this section is from DOI, supra note 26.

All three systems use an input and error correction file (the document database) that maintains all the transactions for the Lease/agreement Database until they are used to update the latter. Accepted and deleted transactions are archived to tape and not available for online inquiries. AFS maintains reference data as they currently exist, and does not maintain a complete set of reference data as they were at given times. Royalty data for prior periods are processed against current reference data. This can produce invalid comparisons and exceptions. The system needed to be revised so corrections to prior period financial data could be edited against comparable reference data.

Discrepancies between redundant data elements are dealt with by system assurance reports and IDVS. But the large amounts of redundant data mean high costs and slow speed. There are many more programs than necessary to maintain and access some of these data. The greater the number of programs, the worse the problems of modifying them when requirements change.

The various data integrity problems increase the difficulty of reconciling data from its different sources. Examples of data integrity problems include: 1) AFS does not have a field to maintain agreement termination dates, so it is being stored in the location field. The PAAS interface programs need this field, but are not able to access it. 2) The current system does not handle special lease requirements very well. Thus solid mineral processing has to be forced to fit into AFS'S predominantly oil and gas environment. Comment and other unused fields on AFS screens are used to store solid mineral data. 3) The verify command results in changes in the agreement effective date. 4) The lease location field or bond coverage field has to be used for the agreement number, which then is not displayed on lease inquiry screens. 5) AFS will not accept duplicate API well numbers, so RMP flags them with an asterisk, making data comparisons difficult.

To remedy these problems, this project will aggregate the lease/agreement data for RMP systems, reduce redundant data storage, increase efficiency of data access, and simplify update processes. First, RMP is switching from its current application databases to a subject database--the Common Reference Database. It will then aggregate existing IBM lease/agreement data, and convert BRASS and offshore PAAS to use the database. The Reference Data Document Database will provide reference document tracking, online access to both accepted and unaccepted transactions, and an audit trail of selected changes to a document prior to posting to the database. Because onshore PAAS recently was designed with a similar subject database approach, including effective dating of key entities and relationships, it can be used as the foundation for the common Lease/agreement Database.

The Lease/agreement Database will be modified to accommodate all of RMP's lease management functions; eliminate rent, advanced royalty, and minimum royalty schedules, which will no longer be needed after database modification; and add separate effective dated records where historical records are necessary to establish time-specific payor responsibility or properly edit adjustments to previously reported royalties.

The software will be modified to move sensitive update processes to separate screens; simplify the PIF screens; implement integrated STATSS inquiries to display the data by lease, payor, or agreement; provide menus t. simplify inquiries; and to simplify the IDVS and database assurance comparisons.

These database and software modifications will make lease/agreement data accessible from a central place, providing information more quickly and accurately. Because the reference database will be available to both PAAS and AFS, and these two systems are not in the same IBM/IDMS central version, special requirements for implementation are needed. The actual implementation

will require reference database availability for update in a common central version and availability for retrieval in all the others. Therefore, the SIT suggests that the maintenance of the Lease/agreement Database be performed by one organizational unit within RMP.

As a result of this project, IDVS also will be simplified in that it will compare BLM data to one RMP Lease/agreement Database instead of three or four. This approach also will provide for consistent definition of similar data across all RMP applications. It will eliminate the proliferation of inconsistent data values due to redundant data items, and much of the need for system assurance programs. In addition, it will make auditing easier by providing a complete audit trail of all changes made to reference data documents. Finally, it will facilitate development of a Management Information System.

Financial System Enhancement

This project modifies AFS to reduce redundant data storage, increase efficiency of data access, and simplify update processes; it is scheduled for completion in two stages during FY89 through FY-91. As noted above, AFS uses an input/error correction file (the document database) to maintain transactions until they are used for updating. Accepted financial transactions are stored on the Detail Financial Transaction File (DFTF). In addition, accepted royalty transactions are stored by sales month and year for a period of approximately 6 months. The Financial Database also stores details of accounts receivable and accounts payable subsidiary ledgers until all associated documents are completely processed. The inactive records are then archived to tape and occasionally restored to the database and updated. As a result, an accepted royalty line resides in 4 different records for at least 6 months. In addition, most internal controls are performed with manual processes.

To correct these problems, changes will be made in the Financial Document Database and financial reference data, royalty processing, the general ledger, subsidiary ledgers, and database structure. The Financial Document Database will be modified to add the following functions:

- online access to unaccepted transactions;
- online access to accepted transactions (current and historical) ;
- processing of unbilled royalty-in-kind transactions;
- financial document tracking, for transactions such as refunds, from the receipt of a document until it is accepted as an approved transaction;
- audit trail of selected changes to the document prior to posting to the Financial Database;
- eliminating unused database record types; and
- making, distribution tables more flexible.

Royalty processing will become modular. This will make future changes to royalty processing much easier. Changes to the software will also incorporate the simplification of the Lease/Agreement Database and the Financial Database to eliminate three of the database updates currently in the system.

In addition, internal general ledger controls and reporting of general ledger data will be improved. The accounting functions of other systems will be integrated with AFS. RMP will accomplish these by automating reconciliation of: 1) AFS subsidiary ledgers with the general ledger control accounts, 2) cash transactions with deposit tickets, and 3) AFS cash balances with the Treasury Department. Furthermore, RMP will automate some forms; enhance the general ledger reports to identify net changes, out-of-balance conditions, ac-

tivity by period, and monthly activity by document type/transaction code; create new management revenue reports; and expand online inquiry into general ledger data.

RMP also will implement some subsidiary ledgers now on micro-computers on the mainframe, improve the ability to access the database by lease, and give users better access to financial data. This will involve computing interest on late disbursement to States based on the date cash is received rather than the date a report is received; integrating the three Refund Request Tracking systems with AFS and recognizing it as a subsidiary ledger; improving the accounting for rent, minimum royalties, and advance royalties; incorporating the ability to account for lease bonus payments; recording Treasury confirmation of disbursements; and providing online access to 6 years of detail financial transactions.

All the data needed currently are in the AFS structure, but are not necessarily organized in a manner that allows for processing and inquiry of the data as needed. This approach will take the data that currently are maintained by AFS and organize them so that they are accessible in minutes instead of days.

The systems improvement effort resulted in five proposed database structures for royalty financial processing. The Royalty Document Database stores the images of all financial (royalty, payment, refund, and bill) documents and processes changes to them. The changes will be stored for an audit trail. The Financial Database uses the existing financial areas from the AFS schema plus a new payment reference record to improve the associations between bills/ royalties and checks/refunds. The third structure is a modified version of the DFTF file, which allows documents to be related to each other. For example, a royalty document could be viewed and a list

provided of all bills, checks, refunds, credits, etc., associated with it. This database also will store appeals information (see also "Appeals Database", below). The Accounting Control Database provides the internal controls needed in the automated systems and keeps the general and subsidiary ledgers. Finally, a structure will take care of accounting reference data. This database uses the existing AFS records to maintain current accounting period, the chart of accounts, etc. This will include the common fund so that distribution can be standardized.

The Royalty Document Database, the Financial Database, and the modified DFTF database can be used in combination to provide a consolidated lease history and select audit candidates. Auditors will then be able to request the supporting detail for selected leases and reporting periods.

This project will improve access to financial data to facilitate daily operations, improve the quality of management data, and improve software maintenance capability. It will significantly reduce data manipulation and report review, consolidate the tracking of refunds and eliminate their duplicate entry, reduce data entry time, and automate general ledger controls. Update and inquiry programs also will execute more quickly, and audit trails and automated internal controls will be established.

Product Valuation and Allowance Monitoring

This project establishes an automated allowance and valuation monitoring system and improves RMP exception processing and product valuation capability. The allowance tracking system is now operational. RMP is designing a *proto*-type oil valuation database to run on a microcomputer; they have not yet determined the feasibility of a gas valuation database.

Allowance and product value monitoring currently are performed only on a limited manual basis. For many transportation and processing allowances approved before implementation of the new product value regulations, data were entered on a microcomputer system. The allowances claimed by the payor are on printouts from AFS, and manual comparisons, are made of approved vs. claimed allowances.

Under the new regulations establishing product valuation and allowance requirements , lessees must submit a form detailing an allowance. The existing allowance record on AFS does not contain the fields needed to capture the pertinent data from the new forms. Manual product value checks can be performed now only by comparing unit values reported to AFS with representative prices such as oil postings.

Therefore, this project will establish oil and gas price and allowance databases and perform automated comparisons of payor prices reported on the new forms against expected prices in the database, and of reported allowances with those in the database.

It also will provide automated exception processing for allowances and product values, a significant increase in the number of leases that can be monitored, automatic billing of assessments and interest for regulatory noncompliance, and data leading to further review of payor claims. RMP

estimates that full implementation of this project could increase royalty revenues by as much as $4 million annually (about 0.1 percent of oil and gas royalties collected in 1986).

Audit Bill Disbursement

This project further automates the auditors' billing process by generating more billing detail; it is tentatively scheduled for completion in FY90. Under current procedures, bills sent to payors do not necessarily identify all leases covered by the audit findings, and the final results of the audit are not known until the payor applies the finding rules to leases not included in the bill sample. If the payor submits a check for the audit findings without the appropriate form, the proceeds are disbursed manually (outside of AFS) based on the data from the bill, accompanied by a manual Explanation of Payments (EOP) report. When the proper form is received, the EOP has to be reversed and the form disbursed.

Several approaches are being considered. One approach would allow auditors to download AFS royalty data for all leases and sales periods covered by an audit and create working papers with a spreadsheet. An extract of the auditors' work paper file could be uploaded as a prebilling file and used to produce a prebilling report. This can then be edited and the bill posted to AFS. The special payor form will no longer be required.

Regardless of the approach chosen, the project will provide payers with all the details of the audit findings. It also will allow disbursement directly from a paid audit bill without the payor form. Thus it will reduce the manual workload associated with keying bill data in AFS, and provide payers with more comprehensive bills.

Manual and Tape Report Combination

This project will combine related paper and tape-reported forms prior to processing to reduce exception processing and distribution errors and subsequent meetings with payers, thereby improving exception processing and clientele relations **(FY89-90).** Currently when tape payers need to make a correction, they submit a hard copy form along with the tape (and a check, when necessary) . MMS personnel process the hard copy separately, and AFS **erroneously** issues a bill for insufficient payment when one document (hard copy or tape) has cleared all edits and is completely processed and the other has not.

The revised approach would use a related document number table (including edits to preclude improper combining of reports) . Royalty processing would then combine the tape and hard copy form into one OIP document. This will significantly decrease the time that Lessee Contact Branch (LCB) personnel spend with payers who were erroneously billed because related documents could not be combined prior to processing.

Exception Processing Enhancement

This project further automates exception processing to reduce the number of invalid exceptions and introduce greater flexibility, including the prebilling report and Lease/agreement Database discussed above (FY90-91). Verifying exceptions requires substantial effort because several different reports must be reviewed manually to collect all necessary data. (There currently are 4000 exception bills on hold on the Document Database awaiting resolution.) Much time could be saved if the prebill were accurate and the data needed to perform the research were available in an easily accessible format.

This project will be implemented in 2 phases. The first phase will provide an accurate prebill, thereby eliminating many invalid exceptions. New modules will be written to identify exceptions and generate prebills. Rule-based routines will be used to code the parts of exception identification that are subject to changes in policy and procedures.

Currently, payers have 1 month to report royalties with actual figures and 2 months with estimates. If a royalty estimate is considered too low, it is handled under exception processing. The SIT found that processing insufficient estimates and keeping estimate balances requires too much overhead to be cost-effective. Therefore, they recommended eliminating exception processing for insufficient estimates and replacing it with late payment processing.

The second phase will provide automated exception tracking, online prebill and past exception inquiries, and improved audit trails. The exception identification routines would write prebills to the Financial Document Database, which would then be used to track exceptions throughout the entire exception processing cycle, providing an automated audit trail. Payers with frequent or excessive exceptions can be identified for further action.

As part of exception verification and resolution, changes sometimes are made to the reference data and royalty reports. In addition, the Lessee Contact Branch must be notified to follow-up with the payers. This notification process would be automated so that all changes are sent to the Branch and other sections, either in hard copy or by electronic mail. Management information reports also will be easier to generate.

Appeals Database

This project will provides a standard appeals database accessible by all functional areas in need of timely and accurate appeals data (FY90-91). Appeals information currently is kept in separate functional databases. The information often is the same, but the format varies. The information is maintained on microcomputer applications, which generate reports for both internal and external use. Reports are circulated and updated on the hard copy and then returned to the report generator for update of the database.

This project would provide a central database for creation, update, and report generation of appeals information. This database would capture surety data, and relate appeals to lease/agreement, financial, and audit databases. All RMP sections would have access to the data, but creation and update functions would be limited to authorized users. A memo function would retain a history of who created and changed records, along with the data and nature of the change, for later research and statistical reporting. Standard inquiries and reports (by payor, lease, tribe, originating office, etc.) will be provided.

This project will provide accurate and consistent appeals data, timely accessibility of the data by all users, elimination of several personal computer applications, improved management information, and elimination of the need to develop, maintain, and reconcile the various PC systems and associated reports.

Business Information System

This project will build a data delivery system between RMP's operational databases and the end users, thereby improving program management and information dissemination and using resources more efficiently (FY90-91). RMP cur-

rently has several automated systems (AFS, PAAS, BRASS) to implement operational requirements. These systems have large data collection requirements. Most of the data needed for different functions exists somewhere in one of the systems, but is not organized into reports that serve as effective management tools. Efforts to manage this information have spawned a number of manual and automated support subsystems and ad hoc reports to enable different organizational components to meet their operating and reporting needs. These subsystems and reports are dispersed across all parts of RMP, they are fragmented and supported with manual processes and microcomputers, they require duplicate programming efforts, and they do not meet management information needs effectively or efficiently.

The SIT recommended a Business Information System (BIS) architecture to address all these issues. It would deliver an integrated and consistent informational system to end users in all RMP functions. BIS defines the architecture for the implementation of an information retrieval and reporting service. This architecture runs against a repository of all required business information in a separate information database called the Business Data Warehouse. It puts reporting in the hands of the users, allowing them to select the fields they want for a query, specify the format and level of detail, and choose the output medium. Thus it meets the requirements for both a functional detailed information system as well as a management information system,

The information for general user access needs to be separate from RMP's operating systems production data so that queries and analyses do not disrupt performance and information does not change as it is used.

Data would be received from the RMP operational systems and subsystems (including PC-based systems) in an agreed-upon format and stored in the Business Data Warehouse. This would include employee/contractor workload, finan-

cial, pricing, production, and sales data. These data could be used to determine the backlog of work to be done for employee scheduling, downloaded onto PCS for use with existing tracking systems, or used to generate statistics and develop management reports (e.g., the number of lines by document type, age of rejected lines, or frequency of payor errors) .

A Business Data Directory stores and manages both descriptions of the data in the Business Data Warehouse and the business rules. It thus serves both a help and a menu function. As a help system, it provides a method of locating information, understanding its meaning, and finding the query needed to analyze it. It also aids in understanding the query results by providing descriptions of the fields and the coded values in them, and the age or source of the data. Menus allow users to select a predefined query, or define a new one by choosing from a list of elements available for reporting.

The End-user Interface allows data in the Business Data Warehouse to be viewed online, produced into reports, or downloaded to PCs for use with packages such as Lotus or dBase. Online inquiries would have search capabilities as well as selective sorting, analysis, and printing. The End-user Interface will include both menus and comprehensive help in an online tutorial.

Adjustment Line Monitoring

This project would establish criteria for identifying “chronic” adjusters and set a 6-year limit on adjustments (FY90-91). Under the current AFS design, there is no means of identifying payers who regularly make adjustments, nor is there automated verification to determine whether an adjustment submitted by a payor is correct or that the original line was ever reported. This project would create software to perform after-the-fact comparisons against adjustments. Any exceptions generated would result in a

bill or an audit. It also would generate initial adjustment activity reports to be used to determine the most appropriate criteria for defining chronic adjusters. These reports also would be compared to the originally reported lines to make sure they were submitted.

Bill Fo11ow-Up

This project automates follow-up letter generation (FY90-91) . The current microcomputer-based account receivable subsystem sends out the first two follow-up letters for delinquent payers. The dates of these letters are recorded in the database. The third letter is generated manually. This project would institute a batch process to analyze delinquent bills and identify bill lines that have been unpaid for a specific time period. The process also would identify bills where an appeal has been denied and there is no surety amount. The name and address of the lessee would be obtained from the Lease/ agreement Database, and then used to generate a letter. This approach would reduce the backlog of third follow-up letters from 6 months to 1 month and accelerate the collection of delinquent receivables.

Audit Support

This project provides RMP with an automated system to target audit candidates, consolidate all needed audit data from other operational systems, and track the progress of audits and reports on their results (FY90-91). Currently all these functions are performed manually. AFS produces several lease- and payer-level reports, but their sort sequence, lack of subtotals, narrow focus, and large size limit their usefulness in identifying audit candidates. Consolidated payor and lease history is obtained from a combination of STATSS and hard copy files. Audit prebilling is in hard copy, as discussed previously. Audit tracking is provided by PC databases

decentralized in the regional offices. STATSS also has an audit tracking system that is not integrated with either AFS or the micro systems. Management reporting capability is very limited.

The SIT recommended establishing a single automated system that combines all current requirements. This would combine STATSS, AFS, PAAS, ALMRS, and the Royalty Compliance Division's Royalty Audit Tracking microcomputer system. The system would first review the operational database and write summary level data to an audit database to help identify potential audit areas. As auditors began work on an audit, they would have access to the summary level data and could request the supporting details to provide a consolidated payor and lease history. As the audit progresses, audit actions and findings would be added to the audit database, providing the basis for management reports.

RCD historically has collected an average of $60 million annually with approximately 120 auditors and divisional staff. In March 1990, they had 200 staff and were recruiting 60 more. This system will provide data to the auditors more quickly and accurately, and free up auditors' time to perform more audits and get into more detail. RCD estimates that this system could increase audit findings by $1 million per year.

Systems Integration

This project integrates RMP databases to reduce data redundancy, eliminate duplicate program maintenance, and provide additional functionality to all RMP systems (FY91). The first database would be a common reference database shared by AFS and PAAS. It would contain data currently used by those systems (lease, agreement, operator, payor, etc.) but restructured and optimized in logical areas for effective maintenance and ownership. A common reporter subject area also would be established (separately from operator-specific data) for operations, payers, billees, and refiners.

Integrating BRASS and AFS would facilitate financial reporting by having one set of data reflecting RMP's financial records. This integration also should eliminate the current duplicate processing performed with BRASS payments. The new financial system would provide more flexibility so that future changes to the bonus and rental processing can be handled more easily. This integration also will eliminate the remaining VAX processing.

REMAINING PROBLEMS WITH AFS

In March and April 1988, the DOI Office of the Inspector General (OIG) issued a series of Audit Reports on Mission Accomplishment for various divisions of the Royalty Management Program.[30] On May 23, 1988, those reports were the subject of hearings held by the Senate Committee on Energy and Natural Resources, Subcommittee on Mineral Resources Development and Production.

In their report on the Fiscal Accounting Division (FAD), which operates AFS, OIG found that improvement was needed in collecting, disbursing, and accounting for Federal and Indian mineral revenues. Specifically, OIG found:

1. FAD had not determined the proper disposition of reported over-recoupments on Indian leases because the work was considered low priority. Subsequently, the Division upgraded the priority to resolve this problem.

2. FAD had not dedicated adequate resources to reconcile payer account balances. OIG found 1300 payor accounts that were not reconciled, and had not implemented adequate procedures to resolve reported underpayments.

3. FAD did not assess liquidating damages against payers for erroneous reporting that qualified as warning errors and did not prevent disbursement of royalties.

4. FAD did not disburse some royalties in a timely manner, resulting in a loss of interest to coastal States.

[M] DOI, supra note 6.

At the hearings on those reports, Senator Melcher, as Subcommittee Chairman, expressed concern that, although FOGRMA established a comprehensive Federal system for royalty management in 1982, MMS had taken seven years to establish such a system. Moreover, Melcher noted that according to the OIG reports, MMS' efforts still fell short of the requirements of the Act. According to the testimony during the hearing, there is no evidence of overt theft, but there is poor collecting of reported underpayments, and poor disbursements of receipts to the States and Indian Tribes.*

The Honorable James R. Richards, Inspector General of DOI, testified that MMS is making a major commitment to resolving the outstanding problems. OIG'S continuing concerns related to: 1) DOI'S delay in issuing final regulations under FOGRMA; 2) royalty compliance, including inadequate lease coverage, the lack of a comprehensive lease audit plan, and the inordinate amount of time and money spent investigating alleged overpayments; 3) poor disbursement of receipts to States and Tribes; and 4) the shortfalls in cost effectiveness and efficiency in expanding PAAS to include onshore leases.

Senator Melcher also expressed concern about the expense of converting the AFS system to the IBM mainframe, and asked whether the resulting benefits in royalty collection justified that cost. William Bettenberg, then Director of MMS, responded that MMS could not really quantify the benefits. He noted that the overall system essentially remains unchanged, in the sense that the reporting software is the same, but the operating environment is much better.

" The Federal Onshore Oil and Gas Leasing and Reform Act of 1987 amended the Mineral Leasing Act to add extensive provisions for preventing fraud in the sale of Federal oil and gas leases. These provisions deal with schemes by which noncompetitive leases were being segmented into small parcels, each of which was sold for substantial prices.

In terms of MMS' conversion efforts, Bettenberg testified that the task of cleaning up the databases (reformatting all the data for the new system) is complete. To eliminate dual databases and inconsistencies, responsibility for the receipt, entry, edit, correction, and distribution of onshore production data was transferred from BLM to MMS in 1988, and the transition should be complete sometime in FY89. According to Bettenberg, the remaining database problems are primarily due to errors in payment and reporting, which should be alleviated through MMS' training efforts.

The concerns raised in the OIG reports led to the Senate Committee on Energy and Natural Resources request that OTA undertake a study of the technological opportunities for improving royalty collection. In particular, the Committee requested an assessment of the adequacy of the AFS hardware and software to ensure maximum cost-efficient recovery of royalty revenues.

OTA found that the current AFS hardware (IBM 3081 mainframe) and operating system remedy most of the problems that arose with the previous VAX minicomputer system. For the most part, the AFS operating environment is adequate for the size and complexity of the workload.

The principal remaining problems are data and software-related, primarily due to multiple data sets and data inconsistencies. While internal validation of the database, payor training, and other efforts have reduced the input error rate to 4 percent, the different databases and update files significantly reduce MMS' ability to ensure accurate royalty reporting and payment. For example, AFS verifies its accounting and disbursement through cross-checks with PAAS, IDVS, and other databases and through internal reporting/payment comparisons. Yet AFS, PAAS, BRASS and the other databases all maintain separate lease/agreement data and the different RMP units use different definitions and meanings of data fields.

Moreover, data were processed and updated daily, weekly, monthly, or interactively, giving different values to different copies of the data. The processing and update rules also were different for the various copies of the data. Finally, most internal controls are performed with manual processes.

The various data integrity problems increase the difficulty of reconciling data from its different sources. The large amounts of redundant data also mean high operating costs and slow processing.

MMS' system improvement plan includes projects that will remedy these problems. They plan to eliminate three of the database updates currently in the system, aggregate the lease/agreement data for RMP systems, and reduce redundant data storage. Although their long-range plans still call for five database structures for royalty financial processing, those structures are planned to be internally consistent and integrated. Not only would the planned improvements eliminate data integrity problems with system cross-checks, they would improve the audit and appeals processes. Over the long term, database integration also would provide a management information system for easier information retrieval and reporting.

A remaining concern about MMS' long-term plans is that the capacity of the IBM 3081 mainframe is expected to be exceeded around 1991. This coincides with the target date for completion of all elements of the system improvement plan. With the rapid advance in computing and operating system technology, there is a danger that MMS could once again find itself having to convert to an entire new system, with the attendant delays in coming online and the resulting possibility that there would be yet another gap in accurate and timely royalty processing. Care should be exercised in improving the operating system and in choosing a larger computer to ensure that the system can be converted to the new technology without a loss in processing capability.

MMS recognizes these problems. Their acquisition plan currently calls for IBM-compatible equipment and operating systems. Upgrades must be able to run all existing software without modification. If followed, this plan should preclude any massive conversion effort similar to that when AFS moved from the VAX to the IBM.

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