**The Feasibility Assessment of a U.S. Natural
Gas Production Reporting System
Uniform Production Reporting Model**

**Final Report
July 1993 - June 1994**

June 1994

Work Performed Under Contract No.: DE-FC21-93MC30084

For
U.S. Department of Energy
Office of Fossil Energy
Morgantown Energy Technology Center
Morgantown, West Virginia

By
University of Oklahoma
Sarkeys Energy Center
Norman, Oklahoma

MASTER

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ABSTRACT

Natural gas can realize its full potential as a premier energy source only if the uncertainty about the availability of natural gas supplies can be eliminated. Much of this uncertainty stems from the lack of timely and accurate production information needed to support supply-planning decisions and the day-to-day functioning of the natural gas market. This information has traditionally been provided by producing state government agencies as part of their normal function. At a time when the *need* for this information is at its highest, the *ability* of producing state agencies to provide it is at its lowest. Out-dated information systems, changes in the U.S. gas and oil industry, and burdensome organizational issues are making the job of data collection and dissemination increasingly difficult.

The Uniform Production Reporting Model (UPRM) project was charged with identifying the best practices and procedures of the producing states related to the gathering, management, and dissemination of production data. The result of this project is the UPRM Conceptual Model. This model was developed with extensive input from state, federal, and industry representatives and is intended to provide producing states with a flexible framework for addressing the difficulties now facing them.

A window of opportunity exists to achieve a solution due to emerging gas industry standards, advances in system technology, and a growing consensus as to the need to improve production data. That solution is best achieved through state/federal partnership.

We recommend that the U.S. Department of Energy (DOE) adopt this Conceptual Model as the basis of its State Upgrade Program, announced in *The 1993 Domestic Natural Gas and Oil Initiative*. In addition, we recommend that the producing states begin the process of upgrading state systems using the concepts embodied in the model. Finally, we recommend that industry be involved in each state's implementation to ensure that the most cost-effective components of the model are adopted.

Adoption of the Conceptual Model by producing states will provide the nation with vital production information in support of the new natural gas market. The nation's energy consumers will be the primary beneficiary through reduced price risk and increased use of domestically abundant, environmentally-benign natural gas.

ACKNOWLEDGMENTS

Primary funding for the Uniform Production Reporting Model project was provided to the University of Oklahoma by the U.S. Department of Energy under grant number DE-FG21-93MC30084, and by the Office of Governor David Walters of the State of Oklahoma under contract number SW-93-0701. Efforts to place the project and guide its scope were facilitated greatly by Clifford P. Tomaszewski and D. Denise Riggi at the Department of Energy, and by Charles Nesbitt, Michael Harris and Jeanie Robards for the Oklahoma Governor's Office. Mary K. Banken of the University of Oklahoma was the principal investigator for the project.

To complete a project of this size within such a short time frame required an intense commitment by talented project team members. Anne Mycek-Memoli and Joe Cusimano from the University of Oklahoma, and Brian Walker and Elisabeth Schmidt from Andersen Consulting, comprised the core technical team with primary responsibility for gathering and synthesizing a vast amount of information in order to design a Uniform Production Reporting Model and produce the Final Report. The daily cooperation and diligence of those four individuals was crucial to the overall success of the project. Charles J. Mankin, of the Oklahoma Geological Survey, and William C. Liedtke III, an independent energy consultant, provided invaluable input and guidance as technical advisors for the project. Graduate research assistance was provided by Lynn Francis and John Lembcke. Administrative support included significant efforts from Jennifer Veal, Terry Rizzuti, Ann Gray, Michelle Summers and Cheryl Patton. We gratefully acknowledge the skills and dedication of this entire team.

The Uniform Production Reporting Model was made viable through the inputs and reviews of numerous other individuals and organizations. The true architects of the Conceptual Model were the conservation, tax, and royalty agency representatives from the target states. Individuals from these agencies, too numerous to name but all crucial to the task, devoted many hours to assist the project team. Representatives from Oklahoma state agencies were particularly generous with their time and energies in this respect. Valuable guidance was provided by the Advisory Committee of State Regulatory Officials, including William Bryson (Kansas), Herbert Thompson (Louisiana), William J. LeMay (New Mexico), J. Michael Biddison (Ohio), Cody Graves (Oklahoma), David Garlick (Texas), and Don Basko (Wyoming). Significant input also was obtained from representatives from the Minerals Management Service, the Bureau of Land Management, and the Energy Information Administration.

The time, efforts and insights provided by numerous other individuals also were vital to the project. Through their participation in stakeholder groups, various individuals devoted many hours to working with the project team to develop a viable product. We are indebted to them for this assistance. These groups include:

- American Gas Association (AGA)
- American Petroleum Institute (API)

- Council of Petroleum Accountants Societies (COPAS)
- Edison Electric Institute
- Federal Energy Regulatory Commission (FERC)
- Federation of Tax Administrators
- Independent Petroleum Association of America (IPAA)
- Interstate Natural Gas Association of America (INGAA)
- Interstate Oil and Gas Compact Commission (IOGCC)
- Kansas/Oklahoma Division of the Mid-Continent Oil and Gas Association
- Mid-Continent Oil and Gas Association
- National Association of Royalty Owners (NARO)
- Natural Gas Supply Association (NGSA)
- National Association of Regulatory Utility Commissioners (NARUC)
- Oklahoma Commission on Marginally Producing Oil and Gas Wells
- Oklahoma Independent Petroleum Association (OIPA)
- REGS User Group - affiliated with the Revenue and Electronic Data Interchange Committees of the Council of Petroleum Accountants Societies (COPAS) and the American Petroleum Industry (API) Data Exchange (PIDX) Committee

The development of a viable Uniform Production Reporting Model required the time, expertise, and cooperation of these many individuals and groups from the public and private sectors. We acknowledge all of them with gratitude.

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INTRODUCTION AND BACKGROUND

General Trends

Natural Gas Can Realize its Potential as a Premier Energy Source. Natural gas is domestically abundant and is among the most environmentally benign of all the major sources of energy supply. The National Petroleum Council's 1992 analysis showed total resources of 1,295 trillion cubic feet (Tcf) that could provide gas well into the 21st century. Because natural gas is less environmentally harmful than other fossil fuels, it is the cornerstone of the federal government's Climate Change Action Plan, and an important tool in meeting Clean Air Act requirements. Natural gas utilization has increased in the last 6 years by 17 percent, and is expected to increase into the foreseeable future with a targeted utilization of 24 Tcf per year by the year 2010. New opportunities for natural gas utilization abound if government and industry can enhance supply reliability, including remediating concerns over the consistent availability of natural gas.

The Natural Gas Market Has Changed Quickly. The natural gas market has fundamentally and radically changed in recent years. Two events in particular affected all segments of the market: 1) The interstate pipeline industry was restructured in accordance with Federal Energy Regulatory Commission (FERC) Order 636. This Order has completely transformed the interstate natural gas pipeline industry, requiring that interstate companies separate their merchant and transportation functions. 2) The excess productive capacity that had plagued the gas industry since the mid-1980's has disappeared, leaving supply and demand essentially in balance. As a result of these developments, all segments of the industry are facing increased competition and greater risks associated with a market driven industry.

The New Market Requires Timely and Accurate Data. The continued deregulation and diversification of the natural gas market has created a dynamic environment in which producers, consumers, states, the federal government and the marketplace require timely and accurate data of higher quality than currently available. The quality of the natural gas production data will play a vital role in increasing gas deliverability and the development of an efficient national competitive market for natural gas.

Current Production Data Are Unacceptable. Precursor studies have demonstrated the lack of reliability of production data for national energy needs. The 1992 final report of the FERC/DOE Natural Gas Deliverability Task Force voiced a national need for improvements in production data as a necessary foundation for building dependable deliverability estimates.

The State Agencies That Collect and Supply These Data Are Finding That Task More Difficult. The conservation, royalty, and tax agencies of producing states have regulatory and revenue-collection roles that are based on production data collection.

These agencies increasingly are unable to provide timely and accurate production data due to:

- Out-dated information systems,
- Limited state resources, and
- Increased demands on those state resources due to the complexities of the new natural gas marketplace and fundamental shifts in the U.S. petroleum industry.

There is a Window of Opportunity For Improvement. Advances in information technology, the emergence of industry standards, and a growing consensus among all sectors regarding the need for improvement provide a unique opportunity for increasing the quality of the data available to the consumer.

The UPRM Project

The Uniform Production Reporting Model (UPRM) Project. The UPRM project was designed to develop a high-level conceptual model that would promote more uniform production reporting, and to assess the feasibility of applying that model across producing states. This high-level model, by definition, would be generalized and flexible enough to allow individual producing state adaptations within the framework of the model's overall principles.

Project Sponsors included the U.S. Department of Energy and the Office of the Governor for the State of Oklahoma.

The Project Team was led by the University of Oklahoma. The University brought in team members from Andersen Consulting to draw on their expertise in the design, estimation and development of large-scale systems.

The Project Began in July, 1993 and continued through early 1994. This aggressive timetable was necessary in order to generate a product that could be used during the formulation of the fiscal year 1995 federal budget.

National Benefits of Uniform Systems

Improved Data for Federal Policy Making will be available through upgraded state production reporting systems, and those data will be more timely and readily accessible nationally. Federal decision makers will be able to rely on more accurate state production data for addressing issues from tax policy to environmental policy and resource availability. Analysts will have more rapid access to those data, will be able to use the data more efficiently due to standard definitions and format consistencies, and will be in a better position to assess the data's completeness and accuracy.

Increased Federal Royalty Income will be possible for both public and Indian lands, as state production data can be used by the federal government for mineral valuation, audit and data verification purposes. Prior to FERC Order 636, some states estimated that 3 to 5 percent of natural gas was unreported or improperly valued. Those percentages are increasing to as much as 10 percent because gas market and industry changes are

occurring without parallel upgrades of state production reporting systems. Unless changes are made to develop more usable state data, the federal government and Indian tribes have the potential to lose \$28 million per year in royalty income from federal onshore and Indian lands; the same rate of unreported production from federal offshore lands could mean an additional \$130 million in potential royalty losses.

A Stronger, More Competitive Natural Gas Industry will result from a more timely and accurate information flow. As consumer confidence in supplies of natural gas increases, the demand for natural gas will expand. The resulting increased revenues will strengthen the natural gas industry, providing:

- increased employment in high-tech, high paying jobs;
- increased investment in research and development;
- development of domestic energy resources into reserves; and
- increased state and federal revenues.

Efficiencies in Gas Markets Costs will be achieved through new state reporting systems that are consonant with modern industry systems, FERC-mandated Electronic Bulletin Boards (EBB), and Electronic Data Interchange (EDI) standards. EBB working groups were formed and supervised by the FERC to identify and derive consensus for electronic standards that are intended to make transportation of natural gas by regulated entities more reliable and market efficient. In a similar manner, more uniform state production reporting systems, advanced by the federal government to improve data, will lead to better decisions about production levels by natural gas producers, will remove informational barriers that impede the actions of the competitive market, and will reduce economic inefficiency and misallocation of resources.

Energy Consumer Interests will be protected through the availability of more timely and reliable production data. Public utilities and other energy consumers will have access to the information they need for more accurate and economically efficient supply planning. State utility regulatory commissions will be greatly assisted by better supply data. The operation of the gas futures market will be enhanced by a reliance on dependable supply information rather than on outdated or anecdotal information; the result will be a reduction in the short-term price volatility that is caused by uncertainties in gas supply and deliverability. When a one to three cent per mcf increase results in consumer costs of \$180-\$540 million per year, it is imperative that all increases are well-founded.

Producing-State Benefits of Uniform Systems

Better Control of State Resources will be available to state regulatory agencies through upgraded state production systems. Reliable production and supply information is crucial to producing states as they seek to efficiently manage their gas and oil resources. Timely and accurate data will help ensure that all volumes are reported and that state royalty and tax revenues are collected properly; in some states this improvement could increase annual revenues by millions of dollars. The new systems will accommodate the changes in the petroleum industry, including the fundamental changes within the natural gas market, and will include enhanced data quality processes and inter-agency data sharing that will allow the states to more easily monitor and estimate their revenues and resources related to gas and oil production.

Increased State Agency Efficiencies will be natural by-products of upgraded data processing systems. New data processing systems typically include a re-engineering of current business processes, both automated and manual, to allow those business processes to be performed more systematically with fewer personnel resources. Through modern technologies, state agencies' ongoing computing costs can be reduced. By increasing the use of electronic communication and automated information processing, the productivity of agency personnel can be enhanced. Modernized systems will enable states to efficiently provide timely, accurate, consistent and accessible production data to state and federal policy makers and to energy consumers.

PURPOSE

Project Goals. The primary goal of this project was to identify and document the best policies and procedures for the effective collection, management, and dissemination of natural gas and crude oil production data. These best policies and procedures were to be documented in the form of a high-level design called the Conceptual Model. Estimated implementation requirements were included as a component of the overall feasibility of the adoption of this Conceptual Model by producing states.

Objectives of the Conceptual Model. All recommendations contained in the Conceptual Model are designed to achieve improvements in the overall quality and availability of production data in one or more of the following aspects:

- Timeliness
- Accuracy
- Consistency
- Accessibility

Project Guiding Principles. The UPRM project established guiding principles to provide a general framework for the development of the Conceptual Model. The primary Guiding Principles include:

- The state is the primary government entity and owner of the data for non-federal lands. Federal data collection would remain restricted to the current limits of federal onshore and offshore lands by the Minerals Management Service and the Bureau of Land Management.
- The model must be flexible enough to accommodate state-specific requirements.
- The implementation of the model should be predicated on federal incentives to states, not mandates.
- The model must utilize the best existing and emerging data and communication standards.
- The model must provide for cross-agency and interstate sharing of data, and cross-agency verification of information.

Focus on Production of Commercial Hydrocarbons. The scope of the UPRM was limited to data regarding the production of commercial hydrocarbons. Since most states consolidate the reporting of gas and oil, liquid hydrocarbons were included in the model. The UPRM specifically excludes consideration of non-salable and non-hydrocarbon products such as water. It also excludes the transportation, storage and consumption elements of the deliverability chain, though it does provide for an interface to that chain. This narrow definition of scope was imperative to ensure that the resulting guidelines were sufficiently focused to provide the most value for future systems.

METHODOLOGY

Primary Sources of Input. The Conceptual Model is a repository of the best policies and procedures for the gathering, management, and dissemination of production information. Expert input into the development of this repository was provided by a diverse group of stakeholders. Representatives from producing-state conservation, tax and royalty agencies were viewed as the true architects of the conceptual model. In most states, these three agencies have responsibilities that include the collection of production data. Conservation agencies oversee all state regulatory functions in the life cycle of gas and oil wells; tax agencies are responsible for revenues from taxes on volumes sold; and royalty agencies collect and monitor gas and oil royalty income from public lands. The largest gas producing states specifically were targeted during the data collection process. The model's development was guided through an Advisory Committee of State Regulatory Officials, with representatives from Kansas, Louisiana, New Mexico, Ohio, Oklahoma, Texas and Wyoming, as well as federal representation from the Minerals Management Service, the Bureau of Land Management and the Energy Information Administration. Significant input also was obtained from industry reporters and users of production data, primarily through contacts with various industry associations.

Approach Summary. The basic approach to developing the Uniform Production Reporting Model involved the following major steps:

- Current state and federal (MMS, BLM) production data systems and procedures were reviewed and analyzed. Published gas and oil information provided a foundation for this review. For the target states, more detailed information was gathered through mailed questionnaires, teleconference calls, and site visits.
- Based on the preliminary input from state agencies, an initial ("straw man") model was developed as a compilation of the most effective identified procedures.
- The preliminary model was reviewed and refined through a series of meetings with the state, industry and federal experts. The resulting final Conceptual Model is a viable product that is generally accepted by the various sectors involved with production data.
- An approximation was developed of the labor and technology requirements to implement the UPRM. To do this, an estimate was developed for one hypothetical state implementation, and that estimate was extrapolated to the remaining states based on a measure of the amount of gas and oil activity in those states. This approximation method provides a reasonable high-level estimate of the potential costs of a UPRM implementation in various producing states.

RESULTS AND DISCUSSION

Findings

There is a Necessity for Change at the State Level. The state conservation, tax and royalty agencies that normally are responsible for gathering and distributing production data are increasingly unable to do so. The major causes of this situation include:

- Fundamental changes in the natural gas market and the domestic industry have changed the make-up of the data reporters to the state agencies, and the new data reporters are not as well equipped to fulfill their reporting requirements.
- Current production reporting systems were developed by the separate state agencies in isolation from one another, and so the standardization and data links required for inter-agency data sharing do not exist.
- Aging state information systems are suffering from out-dated technologies, and have been "patched" to the point of disrepair.

There is Support For Change Within Industry. Given the continued pressure on the domestic petroleum industry, lowered administrative costs would benefit the industry as well as the consumer. Specifically, many industry members would like to eliminate duplicative reporting of information to multiple agencies within a state, and eliminate unnecessary variations in reporting requirements to different states. In addition, operators are increasingly dependent upon publicly-available production information in the management of their daily operations. A more efficient flow of production and supply data would benefit the petroleum industry and state agencies through increased revenue, and the consumer through the lower cost of gas.

Change is Possible With Federal Assistance. Most guidelines presented in the Conceptual Model are already being utilized in one or more producing states; however, most states will require significant changes in order to have a system that is completely consistent with the proposed Conceptual Model. While it is possible that no state will adopt 100% of the guidelines, many are capable of adopting most of the guidelines; the State of New Mexico's recent efforts provide an example of this potential. The true benefits of the UPRM can be gained only through a multi-state implementation. Although some states may choose to adopt the UPRM unilaterally, federal assistance will be required for a broad-based acceptance and implementation of the UPRM and for the benefits of this implementation to be available to national consumers and the gas market generally.

The Conceptual Model

The ***UPRM Conceptual Model*** is a high-level design of an idealized production processing system for adoption at the state level. The model begins with a generalized description of each of the production-related business events that require regulatory oversight during the life of a typical well. For each business event, a generalized flow diagram highlights the specific system functions, conceptual data stores, and entities involved in the process. Furthermore, within each business event specific opportunities have been identified for developing greater data uniformity; these opportunities have been compiled into a "checklist" of sixty Uniformity Guidelines. The Uniformity Guidelines are the key component of the Conceptual Model, as these are the specific UPRM recommendations for promoting uniformity of production data. The guidelines were classified into five groups:

- ***Reference and Relationship*** guidelines address data identification and linkages (e.g., the use of an API well bore number and the linking of wells to tax groups).
- ***Timing and Content*** guidelines focus on the flows of data into and out of state agencies (e.g., specifying reporting due dates and required data elements).
- ***Communication*** guidelines specify the use of existing telecommunications standards.
- ***Validation and Verification*** guidelines specify steps to be taken to assure data accuracy (e.g., cross-agency data checks).
- ***External Data Sharing*** guidelines provide consistent access methods for data users across producing states.

These guidelines have evolved through numerous discussions with state and industry stakeholders, and each guideline is addressed in detail within the Conceptual Model. They are designed to meet the four objectives set out for the Conceptual Model: **data timeliness, accuracy, consistency, and accessibility.**

Implementation

Requirements. A high-level approximation of implementation requirements was developed to give the DOE an understanding of the basic financial parameters of a state upgrade program. This approximation should be viewed as a "first cut" to identify potential system development and conversions costs for states, based on the relative size of the gas and oil reporting activity within each state. A more definitive cost estimate was not possible within the scope of this project because of the degree to which actual costs will depend on decisions that will be made by individual states. The actual costs will vary from this approximation because:

- Some states have already adopted many of the UPRM concepts, or will adopt only a subset of the concepts.
- Some states could develop joint projects to achieve system development efficiencies.

- The approaches taken by some states will vary from the basic assumptions used to approximate costs (e.g., the mix of state and external labor).

As the state upgrade program proceeds into the next phase, several states should be selected to develop detailed system designs for their agencies, and cost estimates for those designs. These cost estimates will provide an indication of the overall costs for extended implementations of the model. For example, assume that two pilot states are identified for detailed design activities. According to the assumptions made in this implementation model, the total cost for a "Tier 2" and a "Tier 5" state would be approximately \$32 million dollars, which with a 50/50 cost sharing ratio would be about \$16 million in federal dollars. Cost estimates that will be developed by the pilot states can be compared to this approximation, validating and/or refining the estimates and assumptions.

Regardless of the degree to which actual costs will match the estimates within this model, implementation costs will be significant. Evidence of these costs is provided by the current efforts of the State of New Mexico to develop a new processing system for all of their gas and oil reporting activities. Since the New Mexico system includes functions that are not addressed within the UPRM, a strict cost comparison is not possible; however, it is informative to note that New Mexico has invested approximately \$18 million to develop a system to accomplish most of the UPRM goals. In New Mexico, and in most states, the expected returns on the investment will be more than offset by the expected benefits, with expected gains of millions of dollars per year in state revenues.

Time frame. No specific time frame has been recommended; however, the DOE has indicated that it is interested in beginning the implementation of its State Upgrade Program in fiscal year 1995.

Recommendations

The UPRM Should be Used as the Basis for The U.S. Department of Energy's (DOE) State Upgrade Program. The DOE now can take advantage of the significant input received in the development of the Conceptual Model, and look toward implementing the model through state assistance as outlined in the 1993 Domestic Natural Gas and Oil Initiative, Action 3.1 Upgrade State Data Collection and Reporting on Natural Gas Production.

A State/Federal Partnership Should be Established to Ensure the Long Term Success of the UPRM. Producing states and the federal government should develop partnerships in which both agree to work together to refine and implement the concepts presented by the UPRM.

A UPRM Implementation Program Should Begin in Producing States. Producing states should begin assessing their current situations to determine if they wish to participate in the DOE state assistance program, and how to begin the UPRM implementation process.

CONCLUSION

Nationwide Implementation is Feasible

The original project charge was to investigate the feasibility of developing a conceptual model for nationwide use in gathering, managing and disseminating production data. Such an implementation is indeed possible, and many states are interested in adopting the guidelines outlined by the UPRM Conceptual Model. At the same time, the increasing budgetary pressures within states limit their ability to respond. For that reason, federal assistance to producing states will be *essential* for wide-spread adoption of the UPRM or any uniform and usable system of data gathering.

Implementation is Urgent

A window of opportunity for natural gas to become a premier energy source in the United States is present today, but without decisive action, that window could close. The primary barrier to widespread use of natural gas is its perceived lack of supply reliability. This problem is due primarily to the lack of timely and accurate production and deliverability information for supply planning purposes. Inadequate deliverability data and inadequate supply information can cause artificial price volatility; this can negatively impact producers' decisions to drill and to further expand the nation's resources into productive reserves. Since reserve increases will come only through increased drilling, the wide-spread implementation of a uniform production reporting system such as the UPRM improves resource supply planning, which increases opportunities for new drilling. Patchwork revamping of state systems may deplete available state funds without providing national benefits.

Benefits of Implementation

The ultimate beneficiary of improved production data is the consumer. Benefits will accrue through reduced price risk and assured availability of domestically abundant and environmentally benign natural gas. Producing states will benefit from the adoption of the UPRM through better control over gas and oil resources and cross-agency sharing of data. The federal government will benefit from improved data for policy making and from increased royalties for managing public and Indian lands.

The nation will benefit from a stronger, more competitive gas industry. As consumer confidence grows, the demand for natural gas will increase, and the natural gas industry will expand. This will result in increased employment, increased research and development investments, increased conversion of the nation's domestic resources into productive reserves, and an overall positive impact on the nation's economy.

The Conceptual Model is Only the First Step

The UPRM is only the first step in the process of realizing the benefits of nationally uniform production data. It is now up to the state and federal governments to capitalize on the extensive knowledge captured through this effort. The UPRM initiative has required the close cooperation of representatives from state governments, industry, and the federal government. This cooperation will be essential for the long term success of the UPRM. The DOE can assure this success by adopting the UPRM as the basis of its State Upgrade Program, introduced in *The 1993 Domestic Natural Gas and Oil Initiative*, Action 3.1 Upgrade State Data Collection and Reporting on Natural Gas Production.

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INTRODUCTION

Natural gas has the opportunity to become one of the premier fuels for the United States. It is domestically abundant and will remain a critical component of energy supply in our nation for the foreseeable future. The National Petroleum Council completed an analysis in 1992 that showed total resources of 1295 trillion cubic feet (Tcf). These resources could provide gas at our present rate of consumption well into the 21st century (68 years).

The use of natural gas also is less environmentally harmful than the use of other fossil fuels. In many applications, natural gas can be used to reduce the emissions of SO₂, CO₂, particulate, and can sometimes be used to reduce NO_x emissions. For this reason, natural gas is the cornerstone of the federal government's Climate Change Action Plan, and an important tool in meeting Clean Air Act requirements.

Natural gas utilization has increased in the last 6 years by 17 percent and is expected to increase into the foreseeable future. The Department of Energy has targeted the utilization of natural gas to reach 24 Tcf by the year 2010. New opportunities for natural gas utilization abound, assuming the natural gas industry can remediate impediments to supply reliability. The concern over the consistent availability of natural gas is a principal impediment to increasing market penetration by natural gas for electric power generation and utilities.

One of the key causes of the perceived questionable reliability is the unavailability of timely and accurate supply information. A critical component of supply planning is the projection of deliverability, an estimate of future available production that is normally calculated using historical production information. Reliable, consistent and timely production information is not available on the national basis that would allow for reliable national deliverability calculations.

The changes in the natural gas market in recent years have been both fundamental and dramatic. Two events in particular affected all segments of the market: 1) The interstate pipeline industry was restructured in accordance with Federal Energy Regulatory Commission (FERC) Order 636. This Order has completely transformed the interstate natural gas pipeline industry, requiring that interstate companies separate their merchant and transportation functions. 2) The excess productive capacity that had plagued the gas industry since the mid-1980's has disappeared, leaving supply and demand essentially in balance. As a result of these developments, all segments of the industry are facing increased competition and greater risks associated with a market driven industry. In this dynamic environment, timely and accurate data are crucial for the proper functioning of the market.

This report highlights the opportunities made available by significant improvements in modern data system technology and ongoing industry and government standardization efforts. Cooperative efforts by state and federal agencies in upgrading production data collection

processes can better protect the nation's natural gas consumers, better serve the nation's energy producers, and reduce costs for the government and private sectors who provide natural gas and oil production information.

Precursor Study - the FERC/DOE Deliverability Task Force

This project, the development of a Uniform Production Reporting Model (UPRM), was undertaken to meet increasing demands for more timely and accurate gas and oil production information. Specifically, the UPRM project was initiated in direct response to recommendations made by the joint Federal Energy Regulatory Commission (FERC) and U.S. Department of Energy (DOE) Natural Gas Deliverability Task Force in their Report which was published in September, 1992. That task force specifically recommended improving natural gas deliverability data -- including examining "...the propriety and feasibility of developing a standard reporting regime for production data." The Deliverability Task Force Report, on page 1, further concluded that:

- *The ultimate success of the evolving competitive natural gas market depends largely on the quality of signals exchanged by the participants. Without good information on deliverability, those signals can be only partially accurate. In addition, without timely deliverability data, business and government leaders could make flawed decisions based on unreliable information, resulting in skewed economic consequences.*
- *Information on natural gas today is often fragmentary, late, and focused on outdated issues. Redesigning data systems to serve the emerging, competitive natural gas industry is a crucial challenge for the next decade. The information infrastructure that now serves the natural gas industry was built for the industry of the 1950s, 1960s, and 1970s. Vast changes in the world energy markets, along with the recent overhaul of regulatory theory and practice, have instigated relatively swift changes in market roles and structures.*

The Uniform Production Reporting Model (UPRM) Project

Two National Problems

Building on the work of the Deliverability Task Force, the UPRM project has focused on two distinct problems with national production data:

- First:** Dramatic changes in the natural gas market have increased the national need for reliable production data.
- Second:** The data gathering systems of the producing states have been overwhelmed by the changes in the natural gas market and do not provide reliable production data.

Ironically, as the ability to gather and manage production data has decreased, the national need to use and rely upon that data has grown.

Common Solution

Both problems can be addressed with a shared solution: a state/federal partnership to implement a uniform production reporting system. Importantly, the development of a uniform system cannot be accomplished by an isolated state or even by the federal government on its own; close cooperation must occur among states, industry and federal agencies. To that end, the UPRM provides a high-level model from which policy makers can go forward.

Project Focus

The primary focus of the UPRM project is on improving the quality and accessibility of production-related data for the users of those data. This focus requires, by extension, a close examination of the processes and procedures used to capture and process, as well as share basic production data.

Although one of the original catalysts for beginning the UPRM project centered on natural gas deliverability, the UPRM is not a method or model to ascertain natural gas deliverability or productive capacity. The UPRM is focused solely on developing a high-level model to improve and encourage uniformity in gas and oil production data and the data gathering processes. A useful byproduct of the implementation of UPRM concepts will be more accurate and consistent production data that are necessary to model either the deliverability or productive capacity of wells, reservoirs, fields or regions.

Because of the inherent efficiencies of a common system, data for both gas and oil production are addressed by the UPRM. Many of the policy imperatives behind this project, however, apply only to gas production since the oil industry has not taken on the complex characteristics of the gas industry.

The UPRM initiative seeks to achieve a balance between the goal of supplying ideal data and containing the costs associated with providing data of that quality. While the market may benefit from information that is extremely current and accurate, the states and industry operate under economic and practical constraints that may dictate a solution that is somewhat less than the ideal. Changeover costs for both the states and the reporting industries must be recognized. Therefore, this effort seeks:

- to identify specific recommendations for improving the timeliness and accuracy of data,
- to outline the public sector costs associated with realizing these improvements, and
- to highlight the benefits of a uniform gas and oil production reporting system.

CURRENT ENVIRONMENT AND GENERAL TRENDS

Changes in the Natural Gas Market

For the past several decades, broad and continuing changes have been occurring in the natural gas market, driven partly by natural market forces and partly by government actions. These changes have intensified in recent years, resulting in a fundamentally different market structure. While a complete description of the evolution of the natural gas industry is beyond the scope of this document, a general understanding of the shift in the roles and responsibilities of industry participants helps to illuminate the public need for an upgraded and uniform system of reporting production.

Previous Market Structure

Historically, natural gas industry trading arrangements were relatively static. Producers typically "dedicated" a well to a pipeline on a long-term basis; the pipeline purchased, transported and re-sold to a closely defined group of customers, usually the Local Distribution Companies (LDC's; i.e., gas utility companies) for which the pipeline had a regulatory obligation to service. The interstate pipelines served as regulated near-monopolies in the transportation of gas and, except for "split-connected" wells, typically did not compete materially with each other on a short term basis. Gas contracts were in effect for as long as 10 or 20 years, and gas was not re-traded on any kind of periodic basis.

On the heels of gas and oil price escalation in the late 1970's (due in large part to OPEC action and to perceived gas and oil shortages), producers responded to market signals and government incentives by increasing exploration, development, and production. This activity resulted in an expanded international oil supply and a precipitous fall in the price of hydrocarbons. Coupled with the impacts of the Power Plant and Industrial Fuel Use Act of 1978, and the Natural Gas Policy Act of 1978, these developments led to the advent of the popularly described natural gas oversupply "bubble." Because of regulatory constraints, LDC gas sales were on a "weighted average cost of gas" basis which prevented selective resale price reductions to customers who chose to either conserve or switch to competing fuels. Caught by the inflexibility of the pricing structure, the natural gas industry began to lose customers and gas volume throughput.

Market Restructuring of FERC Orders

Because of price inefficiencies within the gas industry and its loss of market share to competing fuels in the early 1980's, the FERC began a series of regulatory initiatives capped by Order 636 which dramatically restructured the natural gas market. Competitive market forces were allowed to come into play in sectors of the industry that previously had been shielded. Contract terms of one month became the norm as buyers and sellers, unwilling to risk long term contracts with pricing that might not reflect changing conditions, adopted a contracting methodology that allowed them to assume price risk for shorter periods of time. As a result, the number of market players and contracts has expanded substantially as these new marketers compete each month to buy gas from producers or resell to industrial gas users and LDC's. Purchasers now buy from a variety of sellers, whose identities may change each month, and producer/sellers find themselves doing business with an equally expanded array of potential purchasers. This highly dynamic interrelationship of parties is in marked contrast to the static relationships of the previous market.

Regulated interstate pipeline companies have been transformed from merchant buyer/resellers of gas into contract carriage transporters. Thus the purchaser and shipper of natural gas often differ from the entity that is measuring, gathering and transporting the gas from field to market. Not uncommonly, the buyer in a given transaction might not have physical facilities in the state in which a wellhead gas sale is being made.

The previous formal structure of the gas industry has evolved into a far more complex and dynamic situation. As the market has become more competitive and diffused, the identification of parties responsible for filing and collecting data has become more difficult. Information is no longer collected and verified by industry participants to the same degree as before. State reporting requirements and procedures predicated on past market structure have begun to show strain.

The Natural Gas Futures Market

The advent of gas futures trading on the NYMEX significantly has changed the pricing and market for natural gas. Futures trading has increasingly "commoditized" gas. The quoted futures prices during the last three days of trading for the next calendar month tend to set the cash prices for gas, even though the futures prices otherwise are not accurate predictors of cash prices. Prices change on the futures market based on anticipated changes in demand for gas coupled with an ongoing assessment of deliverability and production information. Because cash markets ultimately follow the futures market, inaccurate or unavailable production data have the potential to materially affect the price actually paid for gas by consumers.

The Market Impact on Utilities

With the advent of FERC Order 636, the purchase and resale of natural gas in interstate commerce essentially have been deregulated. However, approximately half of the natural gas distribution to consumers remains regulated through state Public Utility Commissions, and the regulated utilities face significant new challenges as their purchasing responsibilities are changing. Both the regulated utilities and their regulating commissions need access to reliable information on both the volumes and values of natural gas, and they can no longer depend on pipeline companies to provide that information. It is in the best interests of the nation's utility consumers to have such information available in a timely and consistent manner from each of the producing states.

The Challenge of Reliable Production Information

The developing structure of the current gas market has dramatically heightened the need for dependable information. In its evaluation of the evolution of the natural gas market, the Deliverability Task Force Report noted that:

- *Information will be the life-blood of emerging and rapidly changing competitive gas markets. In such an environment, parties currently have little experience on which to base their decisions. They will depend far more on information sources than do many participants in older markets. (Deliverability Task Force Report, page 1)*

Information about the quality, quantity and value of gas always has been desirable for ensuring an orderly market. The hallmark of the new gas market and the accompanying regulatory proceedings has been the increased focus on the importance of information. One example of this focus is provided by the FERC mandates and industry work groups on Electronic Bulletin Boards (EBBs) for transportation information. Additional evidence is seen through FERC Order 636's "unbundling of services" which includes restrictions on the preferential sharing of information between pipeline and marketing affiliates.

The effect that changes in the structure of the natural gas market are having on production data quality, collection, and usage can be illustrated by a few examples, given in the respective contexts of the producing, transporting and consuming sectors of the gas industry.

Production Sector

The sheer increase in purchasers of gas production, the month-to-month changes in purchaser identity and gas volumes purchased, and the post-production month data adjustments are aspects of the new gas market that are challenging state production data systems.

Multiplicity of Purchasers. In most of the nation's natural gas wells, individual producer/owners (or "working interest owners") retain the right to separately market their own production. In many wells, these owners have remained content to let the well operator market on behalf of all owners in the well. However, in a substantial number of wells the individual working interest owners market their gas production to their own separately-designated gas purchaser. Several different buyers now purchase volumes of gas from a given well in any given month.

In producing states where "first purchasers" of production are assigned the duty of filing production information with appropriate state agencies, the number of filing parties has increased, the likelihood of partial filing or non-reporting has increased, and the difficulty of detecting non-reported gas production data has increased.

Change in the Nature of Well Operators. In addition to the impacts of the identified market changes, two industry trends have impacted the quality of reporting from well operators to state agencies. First, staff reductions in many gas and oil companies, large and small, have limited the ability of these companies to devote scarce personnel resources to monitor reporting problems. Second, larger exploration and production companies have sold a substantial number of domestic onshore properties to smaller companies during the last decade. Commonly these smaller companies do not have the staffing or experience to manage all of the multiple reporting requirements on well operators.

States must now depend on well operators that might be less prepared to reliably fulfill their reporting requirements than in the past. Because a higher proportion of the wells are being reported by smaller operators, more state agency staff resources are required to assist operators and resolve reporting errors.

Change of Purchasers and Percentage of Volume. Because gas sales contracts of brief duration are now common in a competitive market, working interest owners can switch purchasers frequently, depending on the best price offered to them. For example, a gas purchaser who bought in March might not have reportable transactions in April or May, or might have bought from a different mix of owners in the well and therefore be reporting a different percentage of the well flow.

Many state production reporting systems link all first purchasers to wells and require them to file "zero volume" reports for non-purchase months; these systems have become inundated with useless data. Data verification procedures based on historical purchaser percentages are obsolete.

Post-Production Month Adjustment of Data. Purchasers or shippers nominate expected volumes prior to the beginning of a month. The transporters confirm those volumes and notify the well operator of the gas to deliver. Since natural gas production is not engineered to easily attain close volume tolerances, variances

between expected and actual volumes require extensive after-the-fact corrections. After the month of production, the nominated volumes must be adjusted to reflect actual volumes of gas produced and transported. Those adjustments must then be allocated to the sellers and buyers. This post-production month adjustment process is iterative in nature, often requiring 4-6 months before the data stabilize. Post-production month accounting adjustments have become an accepted and expected aspect of doing business in the current natural gas market.

Producing state agencies are seeing post-production adjustments to gas data increase to nearly 40% of the lines of data reported in any given period. Older systems were not designed for this aspect of the natural gas market, and burden short-handed state agencies with additional manual validation duties.

Transportation Sector

The pipeline and marketing sectors of the gas industry also have undergone substantive changes which have affected their ability to report and their need to use natural gas production data.

Filing and Accounting Requirements. Pipelines and gatherers, as "first measurers" of gas production, commonly are required to file gas production volume information with state agencies. Merchants and marketers as "first purchasers" commonly are the filing parties for value and related volume data. As the sheer volume of separate reportable events has increased, so have the cost and effort required by industry to file their information in non-standard formats to a variety of state agencies. Just as the producing state agencies face the difficulties of post-production month adjustments and the sheer number of reportable items, the transportation industry has been similarly affected.

First purchasers and first measurers of production have to meet competing and often conflicting reporting requirements, standards, unique numbering systems, and methodologies. The high cost of maintaining private sector data processing systems to interface with disparate reporting requirements is economically inefficient.

Pipeline Management Data. When interstate pipelines were merchants of gas, they kept and analyzed production data for wells near their systems. When they relinquished their role as merchants, they lost the ability to collect and maintain that information. Today, the pipeline industry could see a growing dependence on state production and related data when making decisions about the need for new or upgraded facilities, or about the management of current facilities. Reliable regional production data are required for management decisions such as offering selective discounting to retain transportation load in the face of competition.

Current state data are not usable for pipeline management decisions in many producing states. The required information is not present, or is not accessible in a format that can be readily manipulated for analyses.

Consumption Sector

Some of the major changes in the natural gas market production information flow have their greatest potential for substantive economic impact on the nation's consuming sector.

LDC Supply Aggregation Responsibility. A product of FERC Order 636 is a shift in responsibility from the interstate pipelines to the LDC's of the duty of aggregating gas supply in a cost-effective manner. This major shift in role for the LDC's requires that they have access to accurate supply and production data in the states and geological basins from which they can obtain their gas. Unlike the interstate pipelines in their previous role, the LDC's typically do not have employees or facilities in the producing regions, direct reserve or production data gathering capability, or an historical perspective on how to go about the task of evaluating gas production.

Producing state records are not currently in a condition to be useful to LDC's in this new duty, yet these consuming state gas utilities must find a cost effective method to accumulate these data. LDC's need ready access to gas volume and value data in order to plan for near and intermediate term supply needs. They also need to rely on these data for both prospective-approval proceedings and after-the-fact prudence reviews with their overseeing Public Utility Commissions.

Difficulty of Deliverability Estimation in a Deregulated Market. Too many variables go into the computation of overall national natural gas peak-day deliverability for it to be calculated with any true degree of certainty. Nonetheless, national and regional deliverability estimates and scenarios need to be modeled for peak-day contingency planning and the protection of consumers. In the old gas market, gas tended to be captive to a particular interstate pipeline, and deliverability planning for the benefit of that pipeline's customers of that pipeline was an engineering exercise that took into account such variables as anticipated demand, supply disruptions, frozen wellhead equipment, and pipeline pressures.

In today's highly interconnected pipeline grid, where gas can "wash" from pipeline to pipeline in response to market price signal, the universe of relevant production data is not only much broader, but the information itself currently is more diffusely held. More information is needed today to forecast deliverability, yet less data are available.

Production data in an accurate and easily manipulated format are essential to model deliverability and make contingency planning on behalf of the nation's consumers. The Energy Information Administration (EIA) and private sector analysts need this information from producing state agencies in a more timely, accurate, accessible and standard format than is available today.

Government/Industry Move toward Standardization

The issue of emerging consensus on national standards deserves special mention. As the natural gas market and the associated information flows have become increasingly more complex, industry and government have joined forces to institute and encourage standards in information flow. Notable among these efforts are:

1. The multi-industry task force that developed the Interstate Natural Gas Association of America (INGAA)/Council of Petroleum Accountants Societies (COPAS) Bulletin #28;
2. The FERC Electronic Bulletin Board (EBB) proceedings and its five industry working groups;
3. The proposed Gas Industry Standards Board (GISB); and
4. The REGS User Group affiliated with the COPAS Revenue and Electronic Data Interchange (EDI) Committee and the American Petroleum Institute (API) Data Exchange (PIDX) Committee.

To the extent that new state systems incorporate these standards, not only do all parties realize the benefits of information standardization, the state action may generate a broader acceptance of these standards. Conversely, if producing states implement new production reporting systems on their own that do not incorporate these proposed standards, the implementation of non-standard state systems may impede the development and acceptance of gas industry standards.

PROJECT INITIATION

Although the UPRM project did not deal directly with natural gas deliverability, its genesis lay in the recommendations of the joint FERC/DOE Natural Gas Deliverability Task Force. Their report demonstrated and voiced a national need for reliable production data as a necessary foundation for building dependable deliverability estimations.

In March 1990, the FERC and the DOE began working together on the Deliverability Task Force. Their primary objectives included assessing the accuracy and utility of available deliverability information; recommending initiatives at the state and federal levels to increase the credibility and timeliness of information being used to measure deliverability; and encouraging the development of accurate, reliable, and timely deliverability information.

The Natural Gas Deliverability Task Force addressed deliverability data through a case study of Oklahoma gas production data for December 1989 and found substantial problems in the quality of that data. In their final report (September, 1992, page 4), they included the following specific recommendations related to production data reporting (emphases added):

- *The Interstate Oil and Gas Compact Commission (IOGCC) should work with the Energy Information Administration (EIA), Department of the Interior (DOI) [Minerals Management Service (MMS), and the Bureau of Land Management (BLM)], and the producing states to examine the propriety and feasibility of developing a standard reporting regime for production data.*
- *DOE should consider the propriety of co-funding the development and installation of hardware and software in those states which are willing to participate in a cooperative effort to standardize the electronic reporting of gas production and deliverability data on a real-time basis to EIA.*

In direct response to those recommendations, the University of Oklahoma (OU) approached both the U.S. Department of Energy (DOE) and the Office of the Governor of the State of Oklahoma to take on the work associated with the investigation and development of a model for uniform production reporting. Both DOE and the Oklahoma Governor's Office agreed to provide funding for the UPRM project. In building its project team, OU contracted with Andersen Consulting to assist in the effort, drawing on Andersen's extensive experience in the design, estimation and development of large-scale systems.

The project officially began in July, 1993 and continued through early 1994. This aggressive timetable was set in order to produce a document that would be usable during the formulation of the FY95 federal budget. The project team was tasked with identifying opportunities for improving the timeliness, accuracy, consistency and accessibility of production-related information, and assessing the feasibility of those improvements.

ANTICIPATED BENEFITS

National Benefits

The anticipated national benefits of adopting a uniform system for production reporting fall into five general categories:

- Improved data for federal policy making
- Increased federal royalty income
- A stronger, more competitive natural gas industry
- Gas market cost efficiencies
- Energy Consumer Interests

Improved Data for Federal Policy Making

Timely and accurate production information is crucial to policy analysts and decision makers. A variety of federal policy makers could utilize the improved information from producing state agencies.

DOE/EIA Analyses and Reports. The EIA uses state data as a basis for responding to information requests and for analytical reports on gas production, deliverability and reserves. If high quality state information was readily available, EIA's effectiveness would be enhanced in its support of DOE and national policy-makers.

FERC Access to State Production Records. Since interstate pipelines are no longer the collectors of supply data, the FERC will need access to new sources of production and related data: the individual state agencies. This information will be crucial to FERC as it evaluates new pipeline facilities construction, long term pricing and supply trends, and pipeline rate-making methodologies.

The FERC has limited jurisdiction over, and consequently limited information about, the flow of gas in purely intrastate transactions. Some of the largest markets for natural gas in the United States are in fact intrastate, and the relationship of supply and demand in those markets has an enormous effect on the interstate markets. To the extent that the FERC has better access to information concerning those intrastate markets, it will be better prepared to protect the interest of consumers.

Congressional Analysis. As Congress evaluates the advisability of various policies for the domestic gas and oil industry, it could take advantage of uniform production

data to project impacts or to monitor the actual effect of any policy initiative. For example, incentives programs for marginally-producing gas and oil wells are the subject of numerous initiatives at both the state and federal level. Analyses of both the expected and the actual impacts of these various proposals requires the kind of data that will be available through a UPRM implementation.

Other Federal Agencies. Given the data collection responsibilities for federal lands, the Minerals Management Service and the Bureau of Land Management stand to directly gain from a move toward uniform production reporting. In addition, uniform state production information would be beneficial to other agencies that have special needs for particular data. The Federal Energy Management Agency (FEMA), the Department of Defense (DOD), the Environmental Protection Agency (EPA), and other federal agencies could benefit from access to such data.

Increased Federal Royalty Income

Public and Indian lands are the largest sources of natural gas supply in the U.S. market. The federal government has the management responsibility to receive proper value for minerals produced from public and Indian lands with a special fiduciary responsibility for Indian lands. Historically, the Minerals Management Service obtained data from pipelines to determine values for royalty purposes, and to provide an external data source for audits and data verification. With the issuance of FERC Order 636, the only source of comprehensive information will be the producing states. To insure that minerals produced from public and Indian lands are valued properly, accurate and timely information in a standard format will be needed by the federal government from each of the producing states.

Royalty income to the federal government from federal onshore and Indian leases in 1992 was nearly \$280 million, with an additional \$1.3 billion in federal offshore royalties. A one percent reduction in royalty evaluation would cost the federal government and Indian tribes \$2.8 million per year for onshore properties alone. Prior to the issuance of FERC Order 636, estimates from some states indicated that as much as 3 to 5 percent of natural gas was unreported and/or improperly valued. Under FERC Order 636, without state upgrades of production reporting and accounting systems, the percentages of unreported and improperly valued gas are increasing; some estimate this under reporting is reaching 10 percent. Therefore, in the absence of accurate and timely state data, the federal government and Indian tribes are potentially losing as much as \$28 million per year in natural gas royalty income from onshore leases; if the same rate of unreported production applies, losses from federal offshore leases would be an additional \$130 million. Most of the potential onshore loss is distributed in the six states with the greatest gas volumes produced from federal onshore and Indian lands, as shown in the table below. Significant ongoing federal benefits would accrue through uniform production reporting upgrades in these states.

1992 Natural Gas Sales and Royalty Income from Federal Onshore and Indian Leases

STATE	FEDERAL ONSHORE		INDIAN LEASES	
	Sales Volume (mcf)	Royalties Received	Sales Volume (mcf)	Royalties Received
New Mexico	734,137,293	\$133,600,103	45,142,344	\$ 9,505,570
Wyoming	308,309,838	58,445,296	5,307,732	2,103,759
Colorado	63,855,694	11,781,494	59,788,870	10,990,326
Utah	45,171,763	7,730,240	8,863,289	3,299,076
Alaska	22,842,381	5,747,143	0	0
Oklahoma	16,854,182	3,419,572	26,087,004	7,559,284

Source: Minerals Management Service, *Minerals Revenues 1992*

A Stronger, More Competitive Natural Gas Industry

One of the long term benefits of more efficient production and supply information flow is a strengthened domestic natural gas industry. As consumer confidence in natural gas production and supply data increases, demand for natural gas as an environmentally benign and domestically abundant source of energy will increase. The resulting increased revenues will allow for greater investment and re-investment in the domestic natural gas industry. A strengthened natural gas industry will provide:

- increased employment in high-tech, high paying jobs within the natural gas industry,
- increased investment in research and development (R&D),
- development of domestic energy resources, and
- increased state and federal revenues.

As the natural gas market continues to stabilize and consumer confidence continues to increase, the natural gas industry can overcome the negative perceptions regarding supply reliability and natural gas can realize its potential as a premier energy source.

Enhanced Gas Market Cost Efficiency

Regulated interstate pipelines are required as a part of the restructuring under FERC Order 636 to implement costly new data, Electronic Data Interchange (EDI), and Electronic Bulletin Board (EBB) systems. Non-regulated entities that wish to remain competitive in the current natural gas market are making corresponding investments in data processing and management. Since many of these entities are both reporters and users of state agency production data, the implementation of new state reporting systems that use the same standards as modern industry systems improves the economics for industry system upgrades. Since regulated companies typically include costs for essential reporting in their rate base, any realized costs savings should ultimately benefit the customers of that pipeline. Without a move toward more uniform production reporting, those entities might be compelled to

maintain duplicative older systems that were designed to meet the complexities of reporting to differing states and agencies. Finally, although electronic gas measurement is not within the scope of the UPRM project, the implementation of more uniform production reporting could encourage its development.

Energy Consumer Interests

Timely and accurate production information is as important to market participants as it is to policy makers. LDC's buying gas on behalf of residential customers, as well as industrial users, must have access to timely and accurate data in order to properly manage their purchases of gas. For example, such information is relevant to an LDC's decision as to whether it contracts for gas on a long or short term basis, whether it hedges spot prices through the futures market, whether it pays a premium over the current spot price in order to ensure a longer term supply, or whether it considers other basins, pipelines or suppliers for its future gas needs.

More Accurate Supply Forecasting. Significant errors or delays in production and deliverability data detract from their usefulness. If timely and reliable data are available, they can be utilized and relied upon for accurate projections of supply to meet anticipated demands. In turn, the short-term price volatility that is motivated by inaccurate projections can be minimized, and producers can more confidently invest in drilling activities to meet future demands.

Enhanced Perception of Supply Reliability. Large-volume energy users are likely to choose clean-burning natural gas as their preferred energy source so long as they perceive that supplies are stable and reliable. Higher quality, accessible data will help demonstrate the reliability of natural gas as a premium fuel.

Reliable Information for the Gas Futures Market. The natural gas futures market, which has a major impact on actual prices paid for gas, is driven in large measure by market assessment of production and deliverability information. If the publicly available production data are flawed or incomplete, a number of negative possibilities arise. Gas industry participants with access to production information have an advantage over those, such as consumers, who do not have that access. The gas market can be, and probably has been, unduly influenced by published conjecture as to reserves and deliverability, even when such projections are not accurate. Estimates from industry identify an average of three cents per mcf as a cost of hedging short-term price volatility. If inaccurate projections inflate consumer gas prices by one to three cents per mcf (which is less than one percent), based on 1993 consumption rates it could cost residential consumers about \$50-\$150 million per year, and commercial/ industrial/utility consumers about \$130-\$390 million per year. Timely, reliable and readily accessible data would enhance the functioning of the futures market, and make it less susceptible to fluctuations caused by anecdotal information.

State Benefits

Producing states, in addition to realizing the above national benefits, also would see more specific benefits in the functioning of key state agencies. The producing states depend upon tax, royalty and conservation agency data in order for those agencies to perform their respective functions. As previously noted, changes in the gas market have made those responsibilities increasingly difficult to fulfill. Clearly, any improvement in those production reporting systems will benefit the agencies and the functions they perform.

Enhanced Control of Revenue Processing

Reliable revenue information is crucial to producing states as they seek to manage their gas and oil resources. Timely and accurate data will help ensure that all volumes are accounted for, that the state's resources are being produced in an economical fashion, and that state royalty and tax revenues are collected properly. In some states, concern has been expressed over an increasing trend toward under-reporting of natural gas due to the changed reporting relationships. By reversing this trend through improved reporting systems, these states could recover millions of dollars per year in state tax and royalty revenues. Furthermore, increased cooperation and data sharing among the state tax, royalty and conservation agencies will permit states to meaningfully project future state income derived from gas and oil production.

Decreased System Costs

A significant upgrade in a state agency's computing environment can bring with it the benefits of newer, less expensive technology. These decreased computing costs can be coupled with more advanced development environments that speed application development, thereby reducing ongoing support costs.

Increased Productivity

A new data processing system typically is a re-engineering of current business processes, both automated and manual, to allow those same business processes to be performed systematically and therefore with fewer personnel resources. The UPRM design should allow state agency personnel to focus on more valuable responsibilities, such as verification of data, rather than having to spend time on processes that could easily be performed systematically, such as the validation of input data.

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PROJECT GOALS

The primary goal of this project is to develop a conceptual model for the collection, management, and dissemination of natural gas and crude oil production data, consistent with the requirements of the producing and consuming states. To achieve this goal, an assessment of the policies in use or planned by the major natural gas producing states was conducted. The first step in that assessment was to identify and document the best policies and procedures for the effective processing, management, and distribution of production information. These best practices were documented in the form of a high-level conceptual model. In addition, estimated implementation requirements were to be prepared for the adoption of the Conceptual Model across producing states.

This conceptual model would examine and propose flexible and timely production reporting procedures designed to:

- Support severance tax, conservation and public land royalty requirements at the state level;
- Streamline industry reporting requirements;
- Accommodate national data standards emerging from cooperative government and industry efforts; and
- Protect consumers by ensuring an efficient, reliable market with clear pricing signals.

MODEL OBJECTIVES

All recommendations contained in the UPRM Conceptual Model, by definition, are intended to achieve improvements in the overall quality of production data. The following four objectives were defined early in the project to provide a stable frame of reference for judging the relative merit of components of the UPRM Conceptual Model:

- Increase *timeliness* in the reporting and distribution of production data;
- Increase the *accuracy* of that data at the earliest possible time in the process;
- Increase *consistency* of that data by promoting nationally accepted input and output standards or conventions; and
- Increase the *accessibility* of that data to users outside each specific state agency.

Increase Timeliness

Increasing timeliness of production data involves reducing the time lag between the end of the production period and the availability of that data. To be valuable to the market and other data users, production data must be available as near the time of production as possible. Data must be collected, validated, verified, and reported by the regulatory agencies. Though modern digital processing can speed transactions, still economic and operational constraints compel some lag in time. Timeliness can be sought at two points: input and output. Current physical and economic constraints might limit opportunities for increasing timeliness at the input end of the state agencies. Conversely, there might be significant opportunities for speeding the release of data from the output end of state agencies.

Increase Accuracy

As highlighted by the experience of the Deliverability Task Force in the Oklahoma Test Case, accuracy of data must be a central objective of a new reporting system. Specifically, a reasonable level of data accuracy must be obtained within an acceptable period of time.

For the first several months following production, data accuracy (particularly for value data) improves in an iterative fashion. New data processing systems, designed to accommodate the heavy volume of post-production month adjustments, should efficiently and accurately validate and post these changes. In the meantime, estimates of data accuracy and completeness should be provided to data users to allow informed decisions.

Increase Consistency

Data consistency is a product of the use of conventions and standards. On a national level, gas industry groups representing buyers, sellers, and consumers of gas are coming to terms on these standards, at times on their own and at times with government encouragement. In general, the adoption of nationally recognized standards would be desirable for all data types; however, in some situations, national standards might require costs that are excessive relative to their benefits. In these cases, a more modest state-wide standard might provide a better solution.

Consistent data facilitates the sharing of data across agencies within a state and provides the infrastructure necessary for automated comparisons of volumes and/or values. In addition, consistent data allows for straightforward comparison of information across states.

Increase Accessibility

Historically, producing state agencies designed their production data processing systems for their own internal use, with only after-the-fact modifications to permit others to retrieve data from their files. Emphasis should include making these valuable public data available by way of multiple media, at multiple levels of aggregation, using a standard output format.

EIA, private sector analysts and others need on-line access to data in its freshest form, albeit at times flagged to mark unresolved discrepancies. Reliable production data must be accessible to consumers and their agents in today's gas market. Reliable production records also must be readily accessible on a prompt basis to the gas and oil exploration industry, for whom they are indispensable tools in the exploration and development processes.

GUIDING PRINCIPLES

At the outset of this project, certain key assumptions emerged as consensus principles to philosophically anchor the construction of the final model. The following list of guiding principles was used in the development of the Uniform Production Reporting Model.

The State is the Primary Government Entity and "Owner" of the Data for Non-Federal Lands

State agencies are the optimal gatherers, processors and repositories for on-shore and state-waters production data. State governmental entities also are the historical collectors and disseminators of those data. Producing states have enormous investments in production data gathering and processing infrastructures. Data collection responsibility for federal onshore and offshore production does exist within two federal agencies, the Minerals Management Service and the Bureau of Land Management. Beyond that function, the federal government should avoid creating any new comprehensive production data gathering system in addition to those already in place, as such a step would be duplicative and economically inefficient.

Additionally, state agencies have a substantial incentive to maintain systems that meet the key objectives of timeliness and accuracy: state tax and royalty revenues are dependent upon sound production data.

For these reasons, this project assumes that the current flow of information from industry, to the state governments, and ultimately to the users of data is the appropriate approach. Charted below is a simplified presentation of data flow as contemplated under the UPRM:

Rather than duplicate existing reporting to state or federal agencies, the selected approach was to build a model that could be uniformly applied within producing states. The approach of the UPRM thus capitalizes on the historical perspective obtained by upgrading existing processes and systems.

Provide Incentives, Not Mandates

The UPRM is designed to be a voluntary, grass-roots approach to solving the problems related to production data at both the national and state level. It is assumed that participation during all phases of UPRM development -- feasibility assessment, design, installation -- is completely voluntary on the part of the producing states. It is further assumed that DOE may elect to encourage states to participate in the effort through creative incentives such as the cost-sharing of hardware and software acquisition. Note that no assumption is made about the *specific methods* DOE may use to encourage participation.

Ensure Flexibility for State Adoption

The UPRM seeks to combine the most effective processes and procedures of all producing state agencies. It is important to recognize that a high-level model defined at a *national* level will almost certainly have aspects that do not fit with the realities of individual states. It is crucial that the UPRM reflect the best practices, but maintain a flexible structure to allow individual state adaptation.

Strive for Simplicity

A primary contributor to data quality problems is the sheer level of complexity in the energy business, the associated regulatory processes, and the production data itself. The problem is further magnified when states have differing reporting requirements, processing methods, and data distribution practices. Data reporters, processors and users face unnecessary complexities that can be alleviated by *any* adoption of more uniform production reporting practices. Within the UPRM Conceptual Model, every opportunity is taken to simplify and streamline the human interfaces with the processing system, i.e., let the system rather than the people handle these complexities. The goal of this simplification is not only the improvement of data quality, but also the reduction of resources required to report, process, and use production data for the energy industry, government agencies, and the spectrum of data users.

Provide for Cross-Agency Sharing of Data

State agencies involved in the oversight of the gas and oil industry utilize extremely similar data. Given that, the UPRM project has attempted to identify opportunities for sharing both common reference and transaction data. Such sharing will increase the effectiveness of the agencies involved and ultimately will produce higher quality data. Specific considerations for this guiding principle include:

Store Data at the Lowest Common Level

By storing data at the lowest common level, agencies or users of production data will be able to aggregate data to the level appropriate for the task at hand. In the UPRM, that level is the individual well completion level within a well bore where separately measured and reported; otherwise, the well bore level is the lowest common level.

Define the Data Model Based on True Business Entities

Many older information systems utilize artificial keys for storing and accessing data, many without regard to the actual business situations being addressed. This approach yields systems that are inflexible and expensive to maintain. By developing a rigorous data model based on true business entities (e.g., well completions, leases, units, etc.), a state's conservation, tax and royalty agencies will benefit from long-term flexibility and economy.

Define Common Reference Data and Relationships

Data that are collected and maintained by different agencies typically reflect different entities and data levels. To compare data across agencies, a common set of reference items (i.e., entity identification codes) must exist, along with the identified

relationships between entities. For example, links should exist between each lease and the wells that are on that lease.

Ensure the Verification of the Data

To increase the accuracy of the data, the UPRM identifies opportunities for enhancing data quality through a three-stage process of data validation, data verification and cross-verification. While some of these data quality steps are currently performed by some state agencies, systematic progress to the cross-verification stage typically is not possible within current systems.

Data validation is the initial screening of data transactions to reject clear and gross errors and would include checks for non-numeric production values, invalid well or operator numbers, etc.

Data verification is the more sophisticated internal agency data editing which would analyze records after transactions have been posted and flag order-of-magnitude errors and other concerns about the data. For example, a well that normally produces a daily volume of 10 mcf that suddenly jumps to a daily volume of 100 mcf would be identified during data verification.

Cross verification is the inter-agency comparison of one agency's data against comparable data reported to other agencies. For example, a tax agency can cross-verify purchased volumes against measured volumes reported to the conservation agency.

Utilize Existing or Emerging National Standards

This project specifically avoids defining new standards for the categorization or transmission of production data. It does seek to incorporate standards generally accepted by industry and government to discourage producing state agencies from adopting unique conventions not shared by other states, agencies or industry.

State Standards

The UPRM effort distinguishes between standards that have national application, and standards that would operate best on a state-by-state basis. State specific standards would be appropriate in situations where the economic benefit of utilizing a national standard is not sufficiently great as to offset the required cost of using the standard. For example, state taxing agencies normally have rigorous requirements for the definition and use of taxpayer identification codes. No suitably stable standard exists on a national level, and the development of such a code would almost certainly prove expensive.

National Standards

Through joint efforts of trade organizations such as API, COPAS, AGA, INGAA, NGSAA, IPAA and others, many valuable national standards have emerged. These standards have emerged for both the identification of entities (e.g., well bores, transaction points, etc.) and for the communication of data between business partners (e.g., REGS EDI transaction datasets based on ANSI standards). The UPRM attempts to identify all relevant standards and uses those standards that are suitably stable and economically defensible for implementation.

Anticipate Interface to A Transportation Model

The UPRM project focuses exclusively on the production segment of the gas and oil industry. No recommendations are made about downstream activities such as transportation, storage, or consumption. Although *this* project does not address such components, future efforts may prove necessary to define similar standards. Given that, it is important that the UPRM recognize interface points to the next logical aspect of an overall model. That next logical step would involve the removal of product from the lease by the transportation segment. Specific consideration should be given to these interface points and flexibility should be included to the extent practical so that long-term inter-connectivity between models can be maximized.

Focus on Data Users

One of the primary catalysts for the UPRM project was the lack of quality production information for data users. While the need for deliverability data provided the initial impetus, the resulting systems also need to accommodate other uses for production data. It is imperative that this effort continually focus on ways to provide data to various users in a manner that is both effective and economical.

Anticipate Future Demands on State Systems

A stock axiom in data system design is that extra attention spent in the planning and design phase of a system can substantially minimize cost and wasted effort during the implementation and use of the system. In the context of the UPRM, this project has attempted to identify, at a high level, any potential long-term demands on state systems utilizing UPRM concepts.

DEFINITION OF SCOPE

The UPRM project focused exclusively on improving the data associated with the production of commercial hydrocarbons. This definition of scope makes the following specific assumptions:

- Only the *production* portion of the gas and oil value chain is addressed. No attempt is made to address transportation, storage, or consumption.
- Only *commercial hydrocarbons* are addressed. No attempt is made to address other, non-salable products such as water. In addition, no attempt is made to address salable non-hydrocarbons such as sulfur.

This narrow definition of scope was imperative to ensure that the resulting guidelines were sufficiently focused so as to provide the most value for future systems. Other factors such as those mentioned above may be of sufficient importance as to warrant separate study in a manner similar to that given UPRM. The following sections explain in more detail the UPRM's strict definition of scope:

Production vs. Transportation and Storage

One of the original drivers for beginning this project involved questions surrounding natural gas deliverability data. Deliverability can be quantified at various points along the delivery stream: from wellhead to burner-tip. This project has focused exclusively on production information, the beginning of the gas and oil data chain. It does not attempt to address transportation or storage volumes or any other aspects of deliverability. These areas are sufficiently complex to deserve separate treatment in a manner similar to this effort.

All Commercial Hydrocarbon Products vs. Natural Gas Alone

Again, although this project is tasked to review natural gas production data, state reporting systems process that data with other hydrocarbon production data. Given the highly integrated nature of gas and oil data, it was deemed appropriate to investigate both major products.

Although other valuable minerals, such as sulfur, are often extracted along with hydrocarbons, their inclusion in a system would be a state-specific non-core activity not specifically addressed by this study. Some states also collect data on waste products, such as salt water, the inclusion of which is not a part of this model. Nonetheless,

implementation of the UPRM by a producing state would provide a cost effective opportunity for a state to upgrade the gathering and assessment of those data along with production data for commercial hydrocarbons should it so desire.

Inclusion of Marginal Production and Cost/Benefit Analysis.

In some of the older hydrocarbon producing regions of the country, many of the wells have depleted to a point so near to the end of their economic lives that they cannot bear further increases in operating expense (such as materially increased reporting costs). Situations and specifics such as these must be addressed on a state-by-state basis and are therefore not addressed by the UPRM.

Implementation - Government Costs vs. Industry Costs

The relative potential of various proposals and guidelines to trigger changeover costs for industry could be generally approached, but any detailed quantification of those costs is outside the scope of this project. The level of changeover costs is highly dependent upon both the current and proposed reporting requirements of a specific state, *i.e.*, the requirements that exist today, the specific changes that are proposed, and the costs and efficiencies arising from those changes. Also, the number and size of companies doing business in a particular state would need to be addressed. Ultimately, a cost/benefit and impact assessment of proposed reporting changes on industry would need to be performed at the individual state level as each state formulates its own state upgrade plan or proposal.

Production vs. Deliverability

Production data sets forth what hydrocarbons *have been produced*. Deliverability is a projection of what hydrocarbons *can be produced*, given a set of assumptions. The FERC/DOE Deliverability Task Force looked at the types of information that would be needed to make a defensible estimation of the nation's natural gas deliverability. As their final report highlighted, modeling or estimating deliverability is a complex endeavor that is highly-dependent upon timely and accurate production data. This project builds upon that finding and provides a means of improving production information. It does not attempt to estimate deliverability.

Core vs. Non-Core

State conservation, royalty, and tax agencies are charged with many functions that do not relate directly to the capture and processing of production data. While these functions

are vital and integral functions of the agency, they do not directly impact the scope of this effort.

In order to correctly focus this effort, it was necessary to define **Core** functions and **Non-Core** functions. For purposes of the UPRM, Core functions are those directly related to, or are necessary components of, the capture and processing of production-related information. Some functions that might appear to be related to the production reporting process were treated as Non-Core if such processes had little likelihood of being uniformly handled throughout producing states. Examples of such Non-Core processes would be conservation agency well spacing and calculation of allowable production.

Volumes and Values

The emerging natural gas marketplace will continue to demand information appropriate for the efficient operation of the market. The information demanded includes both volume *and* value. For this reason, both volume and value information are addressed by the UPRM. Note that this definition of scope introduces additional complexities and requires significant input from royalty and tax agencies in the producing states. This additional complexity is more than offset by the increase in the value of the final UPRM product, and for that reason, will be addressed.

The Limits of Real Time

"Real time" transfer of data is normally defined as the transfer of data simultaneously with the transaction giving rise to the data; i.e., production data is reported as it is produced. Real time transfer can also be defined on the *output* side, from the agency systems to other data users.

Input

The UPRM has attempted to determine the degree to which production reporting processes can approach real time. Because of costs and practical consideration, true "real time data" are probably not an economically feasible goal in the *current* state of the gas industry. For this reason, "real time" input data is not addressed by UPRM, although the model does include the flexibility to incorporate real time input should it develop.

Output

The advances in system hardware and software make real time output from state systems an economic and achievable goal. As data are received and validated, they immediately can be made available to the users of the data through on-line access, EDI, etc. For this reason, "real time" output of data will be addressed by the UPRM.

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INTRODUCTION

The general methodology for performing this project consisted of researching existing gas and oil reporting procedures, identifying those procedures which were most effective, and then developing the UPRM Conceptual Model. State, federal and industry input were all considered critical to this process. Major tasks were defined as follows:

- Review and document current systems and procedures that are involved in the collection, processing and sharing of production-related data for state agencies, the Minerals Management Service (MMS), and the Bureau of Land Management (BLM).
- Identify those procedures and ideas that are working effectively and also identify any significant problems encountered by agencies in the processing of gas and oil production-related data. From this information, begin to outline recommendations and potential solutions to identified problems.
- Document the recommendations in the form of a high-level conceptual model, outlining the generalized flow of production-related data from industry, through states and to the end-users of the data.
- Validate the Conceptual Model through discussions with states and additional stakeholder groups.
- Approximate the order of magnitude requirements for implementing the recommended conceptual model in various producing states.

From the outset, the project's time frame would not allow as much detailed research and feedback as might be desirable. Given this, the project was designed to solicit and incorporate as much information as possible within a short period.

SOURCES OF INPUT

The UPRM project team members positioned themselves as the "scribes" of the UPRM model. The true architects of the model were the employees of the primary agencies in the major producing states. This philosophy reflects the reality that the true experts in this field are those who are involved with the management of gas and oil resources on a day-to-day basis. Those states that produce the greatest volumes of natural gas were specifically targeted in the data collection effort. In addition, other stakeholders in gas production data processing - both data reporters and data users - provided critical input on the development of the model.

Advisory Committee of State Regulatory Officials

W. Timothy Dowd, then Executive Director of the Interstate Oil and Gas Compact Commission (IOGCC), was asked to provide a list of state regulatory officials who might serve on the Uniform Production Reporting Model (UPRM) Advisory Committee. Designated committee members were asked to participate in a series of project review meetings. These committee members became important sources of initial information for the project. Committee members included representatives from major gas producing and consuming states, and from the Minerals Management Service (MMS) and the Bureau of Land Management (BLM).

Major Producing and Consuming States

The UPRM Advisory Committee included representatives from major gas producing and consuming states, including:

- Kansas
- Louisiana
- New Mexico
- Ohio
- Oklahoma
- Texas
- Wyoming

Additional Committee Membership

Additional membership on the committee included representatives from:

- Minerals Management Service (MMS)
- Bureau of Land Management (BLM)
- Energy Information Administration (EIA)

Target State Agencies

State agencies that are involved in the oversight of the domestic petroleum industry collect gas and oil production data in support of their regulatory efforts. Representatives from target state agencies in Kansas, Louisiana, New Mexico, Ohio, Oklahoma, Texas and Wyoming were asked to provide information on current methods of collecting gas and oil production data and on suggested enhancements to existing systems. In addition, since federal onshore and offshore lands produce significant volumes of natural gas, the Minerals Management Service (MMS) and the Bureau of Land Management (BLM) were asked to provide input regarding their data management strategies for their lands. With this group, regulatory oversight for over 90% of the U.S. natural gas production is represented.

Conservation

Conservation agencies monitor gas and oil wells throughout their "spud-to-plug" life cycles. In support of their regulatory activities, conservation agencies collect and maintain information on drilling, well completions, well tests, unitizations, production allowables, gas and oil production, plugging and abandonment.

Tax

Tax agencies collect gas and oil production and sales data in support of their processing of taxes on volumes sold. In order to effectively optimize state revenues, these agencies must monitor closely the volume and value data submitted to them. Tax agencies also must have access to other production-related data in order to review and process requested tax exemptions and to conduct periodic audits.

Royalty

Royalty agencies collect gas and oil production and sales data to support their processing of royalty payments on public lands. Royalty agencies also need access to production data collected by other agencies in support of their audit functions. Although Royalty agencies collect information only on public lands, in some states public lands constitute a large portion of the total gas and oil producing areas.

Additional Stakeholders

Stakeholder groups representing the federal government, industry, regulatory agencies, public utilities, royalty owners and other groups all have a vital interest in issues related to gas and oil production reporting. Consequently, input from these groups was considered essential in order to gain a complete understanding of the requirements for the development of a Uniform Production Reporting Model.

Feedback on specific project issues was requested from the following stakeholder groups:

- American Gas Association (AGA)
- American Petroleum Institute (API)
- Council of Petroleum Accountants Societies (COPAS)
- Energy Information Administration (EIA)
- Edison Electric Institute
- Federal Energy Regulatory Commission (FERC)
- Federation of Tax Administrators
- Independent Petroleum Association of America (IPAA)
- Interstate Natural Gas Association of America (INGAA)
- Interstate Oil and Gas Compact Commission (IOGCC)
- Kansas/Oklahoma Division of the Mid-Continent Oil and Gas Association
- Mid-Continent Oil and Gas Association
- National Association of Royalty Owners (NARO)
- Natural Gas Supply Association (NGSA)
- National Association of Regulatory Utility Commissioners (NARUC)
- Oklahoma Commission on Marginally Producing Oil and Gas Wells
- Oklahoma Independent Petroleum Association (OIPA)
- REGS User Group - affiliated with the Revenue and Electronic Data Interchange Committees of the Council of Petroleum Accountants Societies (COPAS) and the American Petroleum Industry (API) Data Exchange (PIDX) Committee

The practical limits of the project calendar prevented the inclusion of more stakeholder representation. The long-term success in the evolution of UPRM will depend heavily on the continued input of additional stakeholders.

APPROACH

The model development was an iterative process of collecting production processing details, extrapolating from those details to define high-level generalizations, and then validating those generalizations through additional reviews of processing details. Specific activities are described below.

Project Kickoff

A project kickoff meeting was held in Tulsa, Oklahoma on June 29, 1993 with members of the Uniform Production Reporting Model (UPRM) Advisory Committee and the UPRM project team.

Project Presentation

The UPRM project team presented project background information and outlined project goals and time frames. The current status of the petroleum industry and the need for more consistent, accurate and timely production data were discussed.

Request for Participation

UPRM Advisory Committee members were asked to assist in initially defining problem areas in current state and federal production data processing. Committee members also were asked to participate in project review meetings to be held in October and November, 1993.

Identification of State Contacts

UPRM Advisory Committee members were asked to identify key people from the Conservation, Tax and Royalty agencies within the target states who could act as contacts for the project. These key people were then contacted by the UPRM project team and were provided with project background information. State contacts agreed to complete questionnaires requesting specific information about state systems.

Review Current State Systems

Research State Characteristics

UPRM project team members conducted research on published gas and oil information in order to collect information on the state characteristics for all producing states. Various publications were reviewed including EIA monthly and annual reports, the IOGCC Summary of State Statutes, and various API publications. State characteristics were recorded for all producing states and were reviewed and discussed with agency representatives for the specific target states.

Review Existing Standards

The project team also conducted research into various standards that exist related to the reporting of gas production data. Some standards (such as the FIPS County Codes) have such widespread use that they are not even addressed in the model. Other standards are only partially implemented or developed within states. The Petroleum Industry Data Dictionary (PIDD), being developed under the auspices of the American Petroleum Institute (API), is an effort to more fully address data standards issues. Some of the key standards issues for the UPRM model are listed below.

Well Numbers. Information on coding formats for API Well Bore Numbers and API Well Completion Numbers was reviewed. UPRM project team members discussed the use of API Well Bore and Completion Numbers with state agency representatives for the target states.

Business Associate Codes. National and state approaches for assigning codes to business associates were reviewed. Project team members addressed the feasibility of assigning uniform codes to operators and other business associates within individual states or at a national level.

Communication Standards. Communication standards including standards and conventions for Electronic Data Interchange (EDI) were researched. Recognized standards and conventions are discussed fully in Appendix E.

Transaction Point Codes. Standards for identifying transaction points such as meters or custody transfer points were reviewed. Evolving national standards such as the Petroleum Information (PI) GRID Codes were examined and are further discussed in Appendix F.

Preliminary Input

Oklahoma state agencies played a key role in providing preliminary information which helped to identify procedures common across states and agencies that process gas and oil production-related data. During a series of working meetings in July, 1993, Oklahoma state agency representatives outlined their current systems and procedures, and identified many of the problems and issues which they face.

UPRM project team members used the information gathered during these preliminary meetings to develop an investigation framework for the project.

Investigation Framework

The investigation framework for the project emphasized the major phases and key business events in a typical well's life that require state agency involvement. UPRM project team members recognized that each state agency has different roles and statutory requirements, and that each is involved in regulatory activities during different stages of a typical well's life. The investigation framework for the project was therefore modeled after the producing life of an ordinary well and was intended to cover the important aspects of a well's life from "spud-to-plug".

Major Phases. For the purposes of identifying and understanding current business processes within state agencies, the life of a normal well was divided into three major phases:

- Develop
- Produce
- Abandon

Business Events. The three major phases of a well's life were further divided into twenty discrete business events that represent significant milestones in a well's life. For the purposes of this project, only selected events were considered for primary emphasis. Primary or "core" business events were defined as those that are directly related to the capture and processing of production-related information. Secondary or "non-core" business events were defined as other business events that are not directly related to the capture and processing of production-related information.

Questionnaires

Packets containing questionnaires designed to solicit information on current methods for reporting gas and oil production data were sent to state contacts within the target states (Kansas, Louisiana, New Mexico, Ohio, Oklahoma, Texas, and Wyoming) and to MMS and BLM. Questionnaires were comprehensive and required significant time and effort on the part of state agency representatives. The packets were sent during the first two weeks of August, 1993 with responses requested by the end of August. Although the time frame was very short, all of the state contacts were very responsive.

The Questionnaire, provided in Appendix D, included the following components:

Organizational Questionnaire. In order to gain a better understanding of state agency structure and overall objectives as they relate to gas and oil production functions, the Organizational Questionnaire asked specific questions regarding state statutes and informal agency objectives. Agencies also were asked to provide an organizational chart for reference purposes.

Systems Questionnaire. The Systems Questionnaire asked specific questions about the current systems used for gas and oil production information and the functions processed by each system. Agencies were asked to furnish information on each automated system used for gathering, processing and reporting gas and oil production-related data.

Business Events Questionnaire. Background materials introduced the investigation framework used to examine states' current systems and business procedures. Each agency was asked to verify specific business event flows and event descriptions as they relate to gas and oil production functions. Agencies also were asked to provide any additional information that they considered critical to understanding their processing of gas and oil related data.

Develop Initial Model

Conceptual Model

A conceptual model is a high-level design of an information system. The intent of such a design is to capture the general requirements of the anticipated system, and to provide a first-draft of the major functions and features to be provided.

Based on the preliminary input received from state agencies and on the review of the returned questionnaires, an initial Conceptual Model or "straw man" was developed. The initial Conceptual Model began as a compilation of the most effective procedures identified during state system reviews. The model was intended to provide a high-level conceptual overview of an ideal system and also was intended to elicit comments and revisions during subsequent contacts with state agency representatives. A copy of the final Conceptual Model is included in Appendix A. The main components included within the Model are listed briefly below and are discussed more fully in the Results and Discussion Section of this report.

Business Events. The Business Events Section of the Conceptual Model provides a high level description of the business events that require regulatory oversight during the life of a typical well, including a generalized flow diagram of the processes. Each business event documents the relevant:

- Uniformity Guidelines;
- System Functions;
- Conceptual Data Stores; and
- Entities

that are further described in subsequent sections.

Uniformity Guidelines. The Uniformity Guidelines are a set of specific recommendations for procedures that would foster uniformity of production-related data and promote the model objectives of timeliness, accuracy, consistency, and accessibility.

System Functions. System Functions descriptions were developed in order to provide an overview of the functions and features normally required to support state agencies involved in the oversight of the petroleum industry.

Conceptual Data Stores. Data stores are simply general repositories of similar information. While they might reflect distinct databases or tables in a final system design, they are not necessarily designed for that purpose. The Conceptual Data Stores were defined at a high level and were intended to provide an example of the data that may be contained in each data store.

Entity Relationship Data Model. The Entity Relationship Data Model was developed in order to provide a better understanding of the business entities involved in the petroleum industry and their relationships with one another. The data model was designed to provide a general approach for capturing information about entities and their relationships, recognizing that these might vary somewhat from state to state.

Work Sessions

UPRM project team members participated in numerous working sessions to discuss the information contained in the completed questionnaires received from state agencies and to develop, review and refine the individual components of the Conceptual Model. The working sessions were intended as *data gathering sessions* - during which UPRM project team members collected data for the initial development of the Conceptual Model; and *review sessions* - during which UPRM project team members reviewed and refined the Conceptual Model and the Implementation Requirements.

Data Gathering Sessions. Project team members conducted site visits with state agency contacts and key agency staff beginning in July, and continuing through September, 1993.

Site visits were conducted with the MMS Royalty Management Program in Denver and the BLM (Denver office), and with state agency contacts in Louisiana, Oklahoma, and Texas. Information obtained from the completed state questionnaires was reviewed during the site visits, and additional information was discussed.

Teleconference calls were conducted during September with additional state contacts and key agency staff in Wyoming, Kansas, and New Mexico. During the calls, completed questionnaires were reviewed and specific issues were discussed in order to obtain a better understanding of current procedures and potential enhancements.

In addition, the written responses to the questionnaire received from Ohio were reviewed and incorporated.

Review Sessions. Project team members conducted detail reviews with key state agency staff in Oklahoma and New Mexico beginning in September, and continuing through October, 1993. Numerous site visits with Oklahoma state agencies provided an iterative review of the Conceptual Model. In addition, a site visit to New Mexico provided the opportunity to compare the Conceptual Model with ONGARD®, their newly redesigned production reporting system.

Implementation Requirements

Order-of-magnitude requirements were approximated for the implementation of the UPRM's Conceptual Model and Uniformity Guidelines in various producing states. Requirements were developed for the following major components:

- Labor (both state and external labor supplies)
- Hardware/system software

These requirements were approximated for an implementation in various states by using the following basic methodology:

1. Develop requirements estimates for a hypothetical state with approximately 40,000 producing wells.
2. Verify these estimates with a state with known costs.

3. Extrapolate these requirements to the remaining states.

Specific details of the implementation requirements are included in Appendix B.

Review and Refine the Conceptual Model

UPRM Preliminary Review

A project review meeting was held in Dallas on October 7, 1993 with members of the Uniform Production Reporting Model (UPRM) Advisory Committee and the UPRM project team. Background information was reviewed and the preliminary Conceptual Model was presented to the Advisory Committee for review and comments.

Contact History Overview. Project team members reviewed the approach used to contact key people from the Conservation, Tax and Royalty agencies within the target states.

Overview of Conceptual Model. Individual components of the Conceptual Model were reviewed, and committee members were asked to provide feedback on any issues that might affect the final Conceptual Model.

Overview of Uniformity Guidelines. A more detailed presentation of the preliminary Uniformity Guidelines was given to the UPRM Advisory Committee members. Committee members were asked to provide feedback on the specific recommendations outlined in the Uniformity Guidelines as they relate to internal state interest group concerns and to organizational and statutory requirements. An in-depth discussion of each guideline provided essential feedback for project team members. Discussion points and concerns were recorded and reviewed in subsequent UPRM working sessions.

Identification of Hurdles. UPRM project team members asked the Advisory Committee to identify potential hurdles that individual states might face if they attempt to implement the Conceptual Model with its Uniformity Guidelines. Recommendations for addressing those potential hurdles also were requested.

UPRM Focus Group Review

A Focus Group conference was held in Norman, Oklahoma on November 9 and 10, 1993. UPRM Advisory Committee members, key state agency contacts and federal representatives were invited to review and discuss the overall Conceptual Model and the Implementation Requirements.

Overview of Conceptual Model. The overall Conceptual Model was presented to conference attendees along with a review of project background and current project status information. Group discussions provided valuable feedback for UPRM project team members.

Uniformity Guidelines Working Sessions. Conference attendees participated in group sessions broken out by agency type (Conservation, Tax, and Royalty) and then by state in order to closely review each Uniformity Guideline. Conference attendees were asked to identify any problems that their state agencies might face in attempting to implement the Uniformity Guidelines.

Attendees also were asked to assign guideline weights and to indicate the potential for state adoption of individual Uniformity Guidelines. Open discussions provided for a sharing of ideas between states and agencies.

Discussion of Implementation Requirements. Conference participants were introduced to the Implementation Requirements, which provided a broad overview of the approximate costs for implementing the Conceptual Model in various states. An overview of the methodology used to determine approximate costs was discussed, and a summary of implementation requirements including an assumed work plan was presented by UPRM team members. Methods for verifying requirements were also discussed.

Long Term Strategies. UPRM project team members and conference attendees discussed long term strategies for moving forward with implementation of the Conceptual Model and Uniformity Guidelines within individual states. Conference attendees discussed potential hurdles that their states might face and recommendations for addressing those hurdles. State agency representatives also discussed funding options and internal state strategies, such as the development of a state task force.

Stakeholder Review

UPRM project team members contacted stakeholder groups representing a wide variety of interests in gas and oil reporting issues. Project background information and specific project goals were discussed with these groups, and feedback was requested on specific project issues. In addition, designated members of the stakeholder groups were asked to review the Conceptual Model, with particular emphasis on the Uniformity Guidelines, and to identify issues and concerns that might impact the final UPRM.

Project Finalization

After receiving and reviewing extensive input from all the sources previously discussed, the project team finalized all documentation for the effort including:

- The project report
- The final Conceptual Model
- The final approximate implementation requirements
- Supporting documentation.

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RE-STATEMENT OF NATIONAL PROBLEMS

As discussed in Section II, Introduction and Background, two distinct problems have been identified at the national level with respect to natural gas production data.

1. There is an Increasing Need for Reliable Data

Dramatic changes in the natural gas marketplace have increased the national need for reliable production data.

2. There is a Decreasing Ability to Provide Reliable Data

The data gathering systems of the producing states have been overwhelmed by changes in the natural gas marketplace and do not provide reliable production data.

While these problems reflect national-level concerns, the UPRM search for a resolution was at the state-level. The methodology of the UPRM project provided opportunities to obtain detailed information about the strengths and weaknesses of each agency's business processes. This research led to several fundamental project findings.

FINDINGS

Introduction

The primary purpose of the Uniform Production Reporting Model (UPRM) is to identify and document the most effective concepts related to the processing of gas and oil production data. The development of the UPRM involved many detailed working sessions with various stakeholders and, by definition, was focused on state processing and problems as related to natural gas production data. The following sections present the major findings of this effort and provide specific examples of the state-level problems identified.

1. There is a Need for Change at the State Level

Agencies involved in the management of state gas and oil resources are being asked to provide value in an increasingly complex environment at a time when there are consistently fewer resources with which to respond. The following problems underscore the urgency of the need for change:

Out-Dated Information Systems

Many state agency representatives expressed concerns about the status of their information systems. These systems are either reaching or have passed the end of their productive lives. Many were developed in the 1970's and suffer from the following problems:

The petroleum industry has fundamentally changed since the time of original systems development. As discussed in Section II, these changes have been especially prevalent in the natural gas industry, where the fundamental roles and responsibilities of industry players have been altered. For example, many states rely on the first purchaser of natural gas to report information to the state. This approach was completely appropriate when pipeline companies played the merchant role, but in the new marketplace, the first purchaser of the gas may not be located in the producing state, may not be aware of the specific source of the gas, and may not be aware of these reporting obligations. Situations such as these are increasingly difficult to identify and are not being handled well by the systems developed for a different marketplace.

The systems have been maintained, or "patched" to the point of dis-repair. All information systems have a limited life span, the number of years being dependent upon factors such as the technology used and the evolution of new applications. An "average" system has a life span of 5-7 years, far less than the normal age of today's state production systems. As systems grow and are maintained, their flexibility decreases. This is a normal phenomenon encountered by systems in all industries. This lack of flexibility develops to the point that the fear of unexpected side-effects makes programmers extremely reluctant to make any additional changes unless they are absolutely necessary. Given the advanced age of most state production systems, it is understandable that they are largely unable to be altered to reflect changing requirements.

Original technology does not provide the productivity levels expected of modern information systems. Many current systems were developed using inflexible technology designed to minimize the use of what was then expensive hardware. Technology advances have sent hardware costs plummeting, opening new doors to software that dramatically increases personnel productivity. Increases in productivity can be expected from the use of advanced development tools by information systems personnel, and from the use of advanced data query and analysis software by agency users. By replacing the older technology, state agencies stand to see dramatic increases in productivity.

Newer and less expensive technology has been developed that provides for more cost-effective processing of information. Cost savings are available not only at the time of acquisition, but also during the operational life of the equipment. Many state agencies can reap immediate benefits by shifting from older, more expensive technologies to newer, less expensive ones.

Lack of Standardization

Across States. There is no single body of uniform standards that provides global direction for state data collection efforts. For example, oil production information may be reported at the county level in one state, but at the well level in another. In those situations where states do work at the same level (e.g., well), there is no guarantee that the coding schemes used by the states are the same. For example, one state might identify wells using an API well number, while another uses a proprietary, state-specific code.

Within States. Within an individual state, it is very common for different agencies to work at different *levels of aggregation*. For example, a conservation agency might focus on individual wells, but the taxing authority is more interested in aggregating multiple wells into taxable groups. Although the underlying data are fundamentally the same (i.e., producing entities), there is no

standard scheme for linking data across agencies in many states. There is simply no way to automatically cross-link and therefore cross-verify data.

Isolated Agencies

Commonly, the three primary agencies (conservation, tax and royalty) that regulate the gas and oil industry are isolated from one another. This situation exists despite the fact that the three agencies work largely with the same group of companies, on many of the same issues. There are considerable opportunities for leveraging the value of the three individual agencies into something greater than the sum of the parts. Examples of the problems encountered are as follows:

There is no central oversight of a producing well from "spud-to-plug". Each agency has its own view of a particular well, and these views can vary significantly. For example, the conservation agency is interested in collecting accurate well completion and well abandonment information, but has no vested interest in providing that critical status information to assist in monitoring royalty and tax functions. All three agencies can benefit significantly from a system which would automatically notify each agency when a significant event has occurred in the life cycle of a well.

There is little or no sharing of data across agencies. Many states have essentially no contact between the three agencies, while some periodically exchange magnetic tapes containing historical detail data. In some states, agencies have to rely on private firms as a source for needed data that should be available through coordinated state efforts.

The three agencies typically develop and maintain separate information systems. This historically duplicative effort is continued even through the underlying reporting industry is exactly the same for each agency. Each well in the state requires both conservation and tax oversight. Given this significant overlap, it is appropriate for the three agencies to share an extensive subset of their information systems.

Overloaded Agencies

State agencies are largely overloaded due to increasing complexity in the industry, fundamental changes in the industry, and insufficient systems support. These factors, taken together, have forced state agencies into a very reactive position; focusing only on the most pressing problems each day. By increasing productivity and removing non-value-added activities from personnel, state agencies stand to provide greater value to the industry they serve, as well as to the public at-large. The following points summarize state agencies' current situation:

The nature of the industry has changed. As noted in Section II, the petroleum industry is changing in ways that increase the workload of the state agencies. Agencies are accustomed to dealing primarily with a few large operators that are responsible for most of the wells in the state. As domestic production declines and the major companies seek larger returns, they are selling many domestic onshore properties to smaller companies and independents. Agencies were designed and staffed for dealing with these larger companies that had specialized staff to handle all reporting and remittance processing. As a greater percentage of wells are being managed by an increasing number of smaller operators, the workload on agency employees increases. Since the smaller companies do not have the specialized staff to focus on meeting the reporting needs of each respective state, state employees are forced to spend an increasing amount of time supporting operators as they take on the new responsibilities. This increase in workload has not, in most cases, been adequately addressed by increased agency staffing levels.

Natural gas market complexity demands special attention. The continued deregulation of the natural gas market has increased the level of complexity involved in the management of natural gas resources. As mentioned before, the apparently simple process of identifying the first purchaser of gas is no longer a trivial task, and a new first purchaser might need additional assistance to understand and meet reporting requirements. This purchaser may, in fact, be a marketer in New York or Chicago who owns no physical assets in the state of production.

Limited Sharing of Data Outside State Agencies

State systems are largely out-of-date and are unable to provide data to users outside the specific agency. Given this, data is inaccessible to users of the data such as producers, LDC's, and national policy-makers. Users outside of the state agencies are unable to economically access data because data are not available on-line, or are maintained at such a raw level of detail as to make use impractical.

2. There is Support For Change Within Industry

In developing the UPRM, it was important to solicit the input and opinions of industry participants, both as providers and as users of production data. Agencies in producing states are sensitive to the need to support a healthy industry within their states, and support a partnership approach to their interactions with industry. Industry representatives were, overall, enthusiastic about the idea of a more uniform approach to the collection and processing of production data. These representatives recognize that the interactions between states and industry are necessary, and can be mutually beneficial. Given that, they were supportive of any initiative that would simplify the reporting process without causing any degradation of the underlying production data system. The following items explain the rationale for this support.

Reduced Administrative Burden

Given the continued competitive pressures in the domestic petroleum industry, lowered administrative costs would benefit all segments of the industry as well as the consumer.

Large and mid-size companies operate in multiple states and stand to benefit from a more standard interaction with all states. These operators must now report information to different agencies in different states using different mechanisms. No two report formats are the same, and only a subset of state agencies allow a limited filing of information electronically. A more uniform approach would provide economies-of-scale to these operators.

Small companies spend a disproportionate amount of their time managing administrative matters. Whereas the larger operators have dedicated staff who manage the reporting requirements for many wells, smaller operators are forced to have employees perform "double-duty". In many instances the companies' engineers or secretaries must prepare reports for state agencies. Given an average 40-hour work-week, any reduction in administrative burden allows those employees to better focus on their primary tasks.

Increased Accessibility of Valuable Data

The availability of high-quality data for industry users will benefit industry's financial "bottom line" by both reducing their data acquisition expenses and increasing their potential revenues. Specifically:

Lower expense associated with acquiring data can be realized by those companies needing state-collected information. The ability to access data from several states in a uniform manner eases the costs of data manipulation. In states where data is not provided electronically, and all information is available *on paper*, at a *central site* only, significant personnel resources are required to

obtain needed information. All of this additional burden could be removed if the state simply provided uniform data via on-line access or in a standard electronic format.

Increased data quality supports better decision-making. Higher quality data allows industry to make better, more informed decisions. Again, the increasingly competitive domestic energy industry necessitates sound decision-making based on solid information.

3. Change is Possible

The UPRM represents the best available concepts for managing a state's gas and oil production reporting. The specific Uniformity Guidelines contained in the UPRM have, in large part, been obtained from the actual practices of the producing states. That is, most of the guidelines are already being utilized, in some fashion, in some state(s). The fact that a specific guideline is already being performed in a state indicates that it is possible to implement that same guideline in another state, barring any statutory or state-specific industry barrier.

Given this, it is reasonable and appropriate to think that a broad implementation of most of the Uniformity Guidelines is possible. The UPRM project team received extremely positive feedback from state agency representatives who were presented with the possibility of such an implementation. It is important to note that New Mexico is well into a complete systems redevelopment effort that is very compatible with the basic tenets of the UPRM, and at least one other state has begun investigating such a process. The overall feasibility notwithstanding, a UPRM implementation effort will require the careful consideration of several factors.

Changeover Costs

The changeover costs from a state's existing policies and procedures to that of the UPRM will vary widely. Some states will incur significant costs in adopting the guidelines, while others may not. As each state assesses its position relative to the Uniformity Guidelines and makes the decision to adopt or not adopt each guideline, it will need to factor in the necessary changeover costs of implementation. As a general rule, the larger the state's production base, the greater the cost of changing over. This changeover cost, while greater in absolute terms, will almost certainly be lower on a per-unit-of-production basis, since the larger states account for significant production volumes. Therefore, upgrading larger states will improve the data on proportionally larger volumes of total production.

Federal Participation is Required For Change

Federal assistance to the producing states is a necessity for change. Through such a partnership, the twin hurdles of insufficient state resources and lack of state inter-agency cooperation can be overcome.

Federal Funding Induces State Funding. State governments are under continuing budgetary pressure. Agency personnel queried during the project believed that state funded improvement of data systems was unlikely without significant federal assistance. In one state, state funding had been tentatively assigned, but was subsequently withdrawn due to budgetary pressures.

Federal Funding Induces Inter-Agency Cooperation. It is not uncommon for the relationships between the independent agencies to be strained, forestalling any attempt at standardization or data sharing. In some states, the incentive of federal co-funding may be the only inducement sufficient to encourage inter-agency cooperation.

Necessity for Critical Mass

Although change is only possible on a state-by-state basis, the true value of the UPRM can only be wrought by a broad-based multi-state implementation. For that reason, it is important that the federal government work closely with the producing states to devise a strategy for taking UPRM from the conceptual design stage through implementation.

Summary

Although the problems identified are not trivial, they are not insurmountable. The UPRM attempts to identify solutions to most of the major problems, and although not a panacea, it does contain solid, workable suggestions for addressing state concerns. The next section introduces the UPRM, its major components, and specific aspects of its recommendations.

SOLUTION: THE UNIFORM PRODUCTION REPORTING MODEL

Introduction

The original intent of the UPRM was to provide a high-level design of an idealized production reporting system. This high-level design is called the Conceptual Model and it contains various documents that describe, in a generalized way, the basic components of such an ideal system. This idealized system is intended for adoption *at the state level*. While the concepts embodied in UPRM are universal and the federal government might play an instrumental role in bringing it to fruition, it is the states who must adopt and live with the UPRM approach.

While developing the Conceptual Model, it became apparent that one component needed to be a "checklist" to document the most effective concepts used in production processing, and therefore to identify those elements which would be instrumental in the promotion of production data uniformity. This need gave rise to the development of the Uniformity Guidelines. These guidelines were incorporated into the UPRM Conceptual Model, and began serving as a primary focal point of the model.

Conceptual Model

The UPRM Conceptual Model is a collection of documents that describe an idealized production processing system. It is, by definition, high-level and not suitable as a basis for detailed systems design and installation. However, it can be used as a first-cut approximation of a system, or as a framework for a more rigorous detailed systems design. The model is intended to convey the major functions and features of a production processing system and presents sufficient detail for this purpose. The following sections present a description of each of the major sections contained in the model. The actual Conceptual Model design documents are located in Appendix A.

Business Events are discrete points in a well's life at which some action must or can occur. Example events include: filing for the initial permit to drill, unitizing a field, and permitting to abandon a well. Twenty major business events in a well's life have been identified and documented in this section. As mentioned in the Section IV Methodology, these business events were part of the Investigation Framework and were crucial in the development of the model. Each business event is documented in Appendix A with the following pieces of documentation:

- An **event description** describes the event, the critical assumptions, and the appropriate Uniformity Guidelines that pertain to the event.
- An **event flow** illustrates the major steps, the relevant system functions and conceptual data stores, and the important business entities involved, in an overall logical flow.
- An **event/function** matrix cross-references the specific steps of the business event with the major system functions.

Uniformity Guidelines. This section itemizes each Uniformity Guideline, identifying its purpose, options, and relevant discussion points. Given the importance of these guidelines to the overall model, they are described in further detail in the coming pages.

System Functions. This section describes the major system functions found in the idealized production system. It documents each function, explains its characteristics, and lists its major inputs and outputs. Examples include Permitting, External Data Sharing, and Data Capture and Validation.

Note that the Business Event section focuses on the business cycle and flow of events. The System Function section has a systems focus. The two are necessarily related in that a specific business event may require one or more system functions in order to complete the event.

Also note that both business events and system functions have been classified as either *core* or *non-core* for purposes of the UPRM.

- *Core* events or functions are those that are directly related to the processing of production-related information.
- *Non-core* events or functions are those that are *not* directly related to the processing of production-related information.

Conceptual Data Stores. Conceptual Data Stores provide a high-level description of the types of databases that will be necessary to support the system.

Entity-Relationship Data Model. The Entity Relationship Data Model outlines the business entities involved (such as companies, wells, transaction points, etc.) in the petroleum industry and their relationships with one another. The names and specific attributes of the business entities were documented to provide a general approach for capturing information about the major entities and their relationships. Specific terminology may vary from state-to-state.

Uniformity Guidelines

As the business events were designed and documented, the Uniformity Guidelines evolved as specific recommendations for making the processing of gas and oil production-related data more uniform. The guidelines were developed as representations of the best practices of all of the state agencies solicited. In fact, most of these guidelines are followed by at least one of these agencies.

The Uniformity Guidelines were developed to be guidelines only - *not mandates* - and have the following characteristics:

- No recommendations are made regarding *who* is responsible for implementing the guidelines.
- The guidelines are broad strategic approaches to achieving uniformity. Specific standards are recommended when they appear to be fairly stable and widespread.
- The guidelines are directly related to the processing of volume and/or value information through state systems. Note that the establishment and maintenance of critical reference data, as well as the processing of transaction data, is included in this scope.
- The guidelines are designed to be flexible. Acknowledgment is made that it might be unlikely for any single state to adopt *all* of the guidelines, that some states might opt for partial adoption of some of the guidelines, and that different states might elect to adopt different guidelines.
- Despite the underlying goal of flexibility, some of the assumptions in the guidelines are fundamental to the overall model. In the model, the well completion is defined as the lowest common denominator from which all entity relationships are built. While in some cases the well bore might serve this function, the model is based on the capturing of essential reference data at the lowest possible level. The identification of the well completion, or well bore, has to be captured in order to link to data at other levels.

The following overview presents a high-level introduction to the Uniformity Guidelines. There are 60 detailed guidelines and each is discussed thoroughly in Appendix A.

Reference and Relationship

The goal of these guidelines is to establish and maintain basic reference and relationship information that will support the processing of production data. Some of these guidelines are focused on maximizing the uniformity of the data across states (e.g., the use of an API well bore number), while others are intended to support cross-agency verification of volumes (e.g., wells are linked to tax groups).

Timing and Content

These guidelines focus on the specific flows of data into and out of state agencies. The majority of these guidelines focus on increasing the timeliness of data (e.g., specifying the maximum time lag between the end of production and the due-date of reporting). Others, however, are focused on increasing the consistency of the data (e.g., specifying the products to be reported on a well test).

Communication

These guidelines are designed to take advantage of existing telecommunications standards for sending and receiving data. Appropriate standards are identified here and recommended for more widespread use in the UPRM.

Validation and Verification

These guidelines focus specifically on increasing the accuracy of the production data. They provide specific recommendations for validating data within a single agency, and then verifying that data within a single agency. Finally, there are guidelines for cross-agency verification of the data. Note that these guidelines depend heavily on guidelines established in Reference and Relationship in that cross-agency verification of data relies on comprehensive reference data. For example, to cross-agency verify volumes between the conservation agency (which receives production data at the well level) and the tax agency (which receives information at the tax group level), there must be a solid link between wells and tax groups that can be used for comparing volumes.

External Data Sharing

These guidelines ensure that external users will have meaningful access to the data. These guidelines lay out specific recommendations regarding the types of data that are available and the formats by which users can access that data. They provide for consistent access methods for data users across producing states.

Other Aspects of the Uniformity Guidelines

The Uniformity Guidelines are specific recommendations that maximize the quality and uniformity of production-related data on a national basis. The development of this list of guidelines involved a continuous review of each guideline relative to the original objectives for the project. Those objectives were:

- Increase *timeliness*,
- Increase *accuracy*,
- Increase *consistency*, and
- Increase *accessibility*.

In order to be accepted as part of the UPRM, each guideline was required to improve the overall quality of the data in one or more of these ways. Many, however provided additional benefits that do not fall into any specific category. The following discussion points summarize some of these other benefits of the guidelines.

Data are Available Across Agencies

In order to cross-agency verify data, there must be an underlying shared set of data. The Uniformity Guidelines specify what kinds of data should be shared across the agencies in order to make this process effective. It is important to note, however, that once users in each agency grow accustomed to sharing the specified data, they will find more opportunities to share data with one another. This continuous process will certainly increase the effectiveness of all three agencies.

Multiple Levels of Data Quality

The Uniformity Guidelines recognize the varying levels in the quality of production data over time. As a general rule, the quality of data increases over time. The Uniformity Guidelines define the following levels of data screening to ensure that the highest quality data is available at each point along the process:

Data Validation. This screen is applied upon initial receipt from the reporting entity. Any data not passing this initial screening is not accepted into the system and is therefore not available to the general public. To pass this type of screening, data must be free of gross errors such as:

- Invalid well number or company number,
- Invalid date (e.g., 3/32/93), and
- Invalid volumes (e.g., non-numeric production volumes).

Data Verification. This screen is applied by the receiving agency. To pass this type of screening, data must pass fundamental checks such as:

- Historical validity checks (e.g., if a well normally produces 1 mcf per day, and is suddenly reported as 1,000 MCF per day), and
- Sub-total checks such that the total reported volumes equals the sum of the detail reported volumes.

Note that data that has passed validation is available for public review, but that if significant errors are discovered during the data verification process, these errors should be highlighted to the public. This is done so that data users can make adjustments for incomplete or erroneous data.

Cross-Agency Verification. This level of screening is applied by two or more primary agencies. This type of screening is more subtle than the previous two in that the basic data have passed fundamental error checks. In this step, deviations in reported data between agencies are caught. For example:

- The sales value for gas is reported as \$1.50 to the tax agency. The sales value for gas is reported as \$1.25 to the royalty agency. This level of verification would flag the discrepancy for analyst review and follow-up.

Note that for this type of verification some error tolerances might be required. If the bases for volume or value reporting differ on the two reports (e.g., they are reported from different transaction points in the system), the error checks will have to allow some level of differences. Nonetheless, this process will be instrumental in identifying systematic errors and will aid significantly in the efficient identification of audit candidates.

Most states now perform basic data validation using information systems, while some perform data verification this way. Very few, though, have the level of sophistication required to perform cross-agency verification. This factor limits state verification processes to those that can be performed manually, mainly through audits.

Standard EDI Communications are Encouraged

Electronic data interchange (EDI) is an emerging technology that not only eliminates the need for manual data entry but also provides standard formats for the transmission of data transactions. Additionally, the acknowledgment of receipt of data and the ability to transmit error transactions back to the source will facilitate timely and accurate reporting of the data.

Reporting Time Limits are Standardized

The Timing and Content guidelines propose time limits for reporting production-related data. These time limits will certainly help increase the timeliness of the data, but they will also help standardize reporting requirements on an industry-wide basis.

Manual Processing of Information is Minimized

The introduction of guidelines involving electronic data interchange (EDI) and cross-agency verification of data assumes that much of the processing of information is handled electronically. By adopting guidelines such as these, states can re-direct state employees from low-value-added manual activities and allow them to focus on more pressing issues.

IMPLEMENTATION

Introduction

Development of the Conceptual Model was the first task for the UPRM project team. The second major task involved determining the order-of-magnitude requirements for implementing that model across producing states. This section discusses these requirements and the methodology used to derive them. In addition, a section is included that outlines some basic considerations for any state beginning an implementation of the UPRM.

Requirements

Methodology

The basic methodology for determining the requirements for implementing the UPRM can be summarized in three steps:

1. Determine the approximate cost requirements for a hypothetical state.
2. Validate the requirements for this hypothetical state against the actual costs of a comparable state (New Mexico) with recent experience in a similar undertaking.
3. Extrapolate the costs of the hypothetical state to the remaining producing states on some quantitative basis.

Implementation requirements were defined for the following major components of the cost of a system installation:

- Hardware/system software
- Labor (both state and external labor)

Appendix B presents a detailed description of each of these steps and the assumptions made in developing the estimates.

Summary

The requirements for implementing the UPRM will vary from state-to-state, depending on the size of the gas and oil reporting activity within the state, among other factors. For this approximation, producing states were categorized into seven tiers based on the number of producing wells in each state. State size will impact system design and development costs to some degree, and will impact data conversion costs to a greater degree. (For example, significantly more effort will be required to link wells to tax groups in larger states.) The tier breakdown for producing states is as follows.

TIER	STATES	AVERAGE # OF WELLS
Tier 1	Texas	236,468
Tier 2	Oklahoma	129,654
Tier 3	Kansas - Ohio - Pennsylvania - West Virginia	59,476
Tier 4	California - Illinois - Kentucky - Louisiana - New Mexico	37,797
Tier 5	Arkansas - Colorado - Indiana - Michigan - Montana - New York - Wyoming	9,887
Tier 6	Alabama - Alaska - Mississippi - Nebraska - North Dakota - Tennessee - Utah	2,646
Tier 7	Arizona - Florida - Maryland - Missouri - Nevada - Oregon - South Dakota	270

Larger Tier 1 and 2 states will require significantly more effort to adopt the guidelines on an absolute basis, but will provide the greatest return on a per-well or per-volume basis.

While Appendix B describes the approximation methodology in detail, the following summarizes the major points.

Labor Requirements. Labor requirements were estimated for a hypothetical state implementation and were adjusted for states by tier. These estimates included efforts required for detailed analysis and design, programming, testing, data conversion and training. The requirements range from:

- 330 work-days per state for the smallest Tier 7 states to;
- 19,000 work-days per state for middle range (Tier 4) states to;
- 32,000 work-days for the Tier 1 state.

Labor Costs. Using the following assumptions, the labor requirements presented above can be converted into costs:

- Assume that 20% of the total work is performed by state employees, with the balance being performed by external labor.
- Assume that state labor costs \$250 per day. This includes salary, benefits, holidays, and overhead.
- Assume that external labor costs \$1,000 per day. This includes hourly fees, travel expenses, and housing expenses.

Using these assumptions, the labor costs range from:

- \$290,000 per state for the Tier 7 states to;
- \$16 million per state for the Tier 4 states to;
- \$27 million for the Tier 1 state.

Hardware/System Software Costs. These costs range from:

- \$10,000 per state for the Tier 7 states to;
- \$1.5 million per state for the Tier 4 states to;
- \$6 million for the Tier 1 state.

TOTAL COSTS. Range from:

- \$300,000 per state for Tier 7 states to;
- \$17 million per state for Tier 4 states to;
- \$33 million for the Tier 1 state.

While Appendix B contains an exhaustive list of assumptions and disclaimers, the following major points deserve special mention here:

- The costs assume a complete development of core functionality as discussed in the UPRM Conceptual Model.
- **The total costs presented here do not include costs for industry to respond to the new reporting requirements by states in the implementation of the UPRM.**
- Only costs to state and federal governments are approximated.
- No assumption is made regarding the source of the funding.
- No assumption is made regarding the timing of the implementation.

Discussion

The costs calculated in this model are approximate costs for a full implementation of all sixty guidelines of the UPRM. The actual costs of implementation may be lower than estimated due to any combination of the following reasons:

- Some states will choose not to adopt the UPRM guidelines.
- Some states have already adopted some or all of the guidelines.
- Some states will adopt only limited subsets of the guidelines.
- Some states could combine their efforts to achieve system development efficiencies.

- The approaches taken by some states will be modifications of the basic assumptions used to approximate costs.

To arrive at more precise cost totals will require more detailed analysis and planning activities than could be accomplished within the scope of this conceptual model project. Individual states will need to assess their own situations and determine their own implementation parameters and strategies before they can derive realistic expected costs. This activity should be supported in the next "phase" of the state upgrade program. Once several of these state assessments have been completed, cost estimates based on the needs of real states, rather than a hypothetical state, can be derived for the extended implementation of the model.

To illustrate this point, assume that two pilot states are identified for detail design activities, and that these two states are from Tier 2 and Tier 5. According to the assumptions made in this implementation model, the total cost for the two states would be approximately \$32 million dollars, which with a 50/50 cost sharing ratio would be a total cost of about \$16 million in federal dollars. As an outgrowth of the "Phase 2" efforts, actual cost calculations for these two pilot states could then become a source for validating project cost estimates for the remaining states, testing some of the assumptions built into this approximation, and identifying further opportunities for cost savings.

Regardless of the degree to which actual costs will match the estimates within this model, implementation costs will be significant. However, for many states the expected returns on the investment will be even more remarkable. For example, in the state of Oklahoma estimates of under-reported production have ranged from as little as 3 percent to as much as 10 percent. If improved reporting systems result in only a 1 percent increase in natural gas production reporting, the state will gain over \$2.5 million per year in state revenues. Within a few years, the system will have paid for itself through increased tax and royalty revenues alone.

Again, Appendix B provides extensive detail regarding the methodology, assumptions, disclaimers, and estimates of this implementation model.

Considerations

The decision to go forward with the implementation of any new system opens the door to many more decisions or considerations. These considerations will increase in number with the complexity of the project and will deserve special attention. The following sections present a list of identified considerations that many states will face as they proceed with the implementation of a system based on the UPRM guidelines.

Scope of Interaction Between Agencies

The process of adopting the UPRM will provide a forum for states to consider organizational changes within the primary agencies as part of the implementation. As the implementation moves forward, these changes could range from a integration of the agencies, to the development of a special "data handling" group, to the simple sharing of databases. Most states will probably choose a route of developing shared systems and data among the three agencies while still retaining individual agency autonomy. Several key areas should be considered in moving forward through this implementation, including statutory requirements, utilization of resources (personnel, computing equipment, and space), and organizational structures.

Management of Change

Many of the concepts embodied in the UPRM are fundamentally different from today's practices. Moving from current systems and procedures to those based on UPRM will require significant change on the part of the organizations involved. The management of this change will be crucial for the successful implementation of a new system. The level of pro-active management will obviously depend on the level of change anticipated by a particular organization. The following points should be considered, however, regardless of the level of change.

Internal Management of Change. Employees will need to understand the new direction, the new goals of the organization, and the new approach to systems and procedures. Effective communication and training will be crucial.

Between State Agencies and Industry. Any significant change that is undertaken by the primary agencies will have impacts on industry. As mentioned before, industry should obviously be involved in the design and implementation of the new system, but special plans need to be made for providing status and direction information to those industry players not directly involved in the effort. In addition, training sessions should be instituted for the appropriate industry participants who must be responsive to the changes being implemented.

States' Selection of Appropriate Uniformity Guidelines

Not all Uniformity Guidelines will be appropriate or practical for implementation in all states. Most guidelines should be appropriate and practical for most states however. Each state will need to decide which guidelines are appropriate for implementation and will need to take into account the impacts of this implementation.

For example, guideline impacts on marginal wells might require special consideration. Many producing wells are nearing the end of their economic lives and are especially sensitive to increases in administrative expenses. As administrative costs increase, they consume a greater portion of the revenue stream, leaving continually smaller profits for well owners. This is especially important when taken together with the natural decline in production that necessarily causes a decline in gross revenue. Each guideline should be evaluated as part of an overall cost/benefit analysis to assess its impact on these wells to ensure that sufficient value is gained from implementation, and to ensure that the guideline does not shorten the effective economic life of a significant number of wells.

Information Systems Issues

Fundamental choices must be made when pursuing the development of a UPRM-based system. The following major aspects must be addressed early in the effort.

Mainframe vs. Mini vs. Client/Server or other PC-based System. One of the first choices to be made by each state involves the selection of a hardware strategy. This choice will need to take into account the long-term direction of the agencies, the relative amount of power required, the available budget, etc. While some larger states may still use mainframe technology for most applications, plummeting hardware costs may make the change to a less expensive solution more appealing.

Custom vs. Packaged Software. Another choice involves the selection of the approach for application software. Application software is normally defined as the business software that assists personnel in doing their day-to-day jobs. Examples in this case would be Permitting, Allowables, and Data Capture and Validation routines. After selecting their basic hardware direction, states will need to decide whether they should buy existing software package(s) or develop new systems to meet their own needs. Some of the considerations to be taken into account include:

- The availability of third-party software packages
- The suitability or "fit" of third-party packages with state needs
- The level of on-going vendor software support that can be expected
- The overall stability and reliability of the vendor
- The cost of new development relative to the benefits of a custom solution

Statutory Issues

The adoption of some guidelines may require statutory changes in one or more agencies. This should be addressed and considered when deciding to implement a specific guideline, but once the decision is made, appropriate action should be taken to ensure that no statutory limitations are in-place that could prevent successful adoption of the guideline on a statewide basis.

Incentives For Compliance

One of the guiding principles of the UPRM effort involved focusing on incentives, not mandates. A philosophical tenet of the effort is cooperation between federal and state governments, as well between government and industry. All parties involved will ultimately benefit from a spirit of cooperation in addressing common concerns. Instead of relying on the usual set of mandates and penalties, state governments can accomplish many of the same objectives through the use of creative incentives. Incentives such as bond reduction or tax credits would provide industry with a vested interest in complying with state statutes.

Financing Considerations

Given the significant costs associated with implementing new systems, it is important that states consider many aspects of the financing of such an undertaking. In addition to soliciting assistance from the federal government, states might consider a number of other financing options, some of which are identified below.

Mechanisms For Recovery of Costs. States might consider some series of fee structures for the use of the new databases. Examples might include:

- Hourly charges for on-line access to the new data
- Charges for transmitting data via EDI
- Charges for sharing of data through other mechanisms (magnetic media, paper, CD-ROM)

Bond Issue Options. When soliciting funding, states might consider issuing bonds by one or more of the primary agencies. This approach assumes that this power is available and that the parties involved are interested in going forward. The issuance of bonds may provide a more consistent source of funding in that there are minimal year-to-year justifications required for this multi-year effort.

Small State Formation of a Co-op. Many of the smaller states might not be interested in developing their own custom systems. Such solutions may be inappropriate or uneconomical. In these cases, two or more small states might consider forming a co-op for the purposes of building new information systems. This approach might provide the economic incentive for the states to continue; whereas they might otherwise have chosen to not participate.

RECOMMENDATIONS

1. UPRM Should be Used as the Basis for DOE's State Upgrade Program.

In its 1993 Domestic Natural Gas and Oil Initiative, the DOE announces the establishment of the State Upgrade Program. Specifically:

- "In 1995 two or more States will join in cooperative demonstrations to upgrade their natural-gas-production reporting systems to be compatible with the University of Oklahoma model, with co-funding of hardware and software acquisitions by DOE." (Page 16)
- "Evaluation of the successful start-up of these initial systems will result in a plan for implementing similar reporting systems in other natural-gas-producing States. While the objective of this action is not to require absolutely identical reporting systems, we expect systems to be developed by 1996 which ensure compatibility among States." (Page 16)

The UPRM is ready to be adopted by DOE as the basis for this State Upgrade Program. As part of this adoption, steps need to be taken to begin further defining specific aspects of this program, especially given the relatively short time frame for implementation in the demonstration states. The following sections outline the major items which need to be addressed during DOE's further refinement of the State Upgrade Program.

Cost Sharing

The total budget for the State Upgrade Program needs to be identified and appropriated, ear-marking these funds for states eligible for assistance under the program.

Roll-Out Approach

DOE is fairly specific about its plans to identify two or more pilot states in 1995 for cooperative demonstrations. The next logical step is to begin working with and encouraging the candidate states for these demonstrations and begin developing specific implementation schedules. In addition, plans must be developed for the mechanism to be used in granting financial assistance to other states considering a systems upgrade.

2. A State/Federal Partnership Should be Established To Ensure the Long-Term Success of the UPRM

The delivery of this report signals the end of the UPRM feasibility study. The DOE is in a unique position to leverage the product of this study into truly uniform production data on a nationwide basis. This leveraging process must recognize that the model is just a beginning and needs to be further refined and updated to reflect new and more up-to-date input. For this reason, it is important that DOE form a partnership with the appropriate state and industry representatives to ensure that this model moves ahead to implementation.

Identification of the Model's "Owner"

The development of a model such as the UPRM is intensive and requires in-depth knowledge as well as continuous involvement by the relevant parties. For this reason, it is important that the model have an "owner". This entity will need to assume responsibility for the model's maintenance and interpretation from the UPRM project team. In addition to maintaining the model, that entity might provide valuable assistance to DOE as it evaluates applications for state assistance.

Definition of Output Data Standards

One of the key guidelines of the UPRM is that data can be communicated from the state agencies to external users in a consistent format. This guideline assumes that a standard format exists for this purpose. Developing such a format was beyond the scope of this feasibility study, and so at the conclusion of the project no such standard existed or was on the horizon. For that reason, a team should be assembled of appropriate experts who can define and document such a standard. That team could also be responsible for defining the standards for data quality statistics that are addressed in another data sharing guideline.

Continued Refinement of UPRM

Once an "owner" of the model has been established, that owner must continue to update the documentation based on new or more current information, such as the approval of new standards or conventions. This will be an on-going process and will require periodic reviews and working sessions by appropriate government and industry experts.

3. A UPRM Implementation Program Should Begin in Producing States

The model is just the beginning point for establishing nationally uniform production data. To take this effort from concept to reality will require that individual states begin implementing the concepts contained in the UPRM. The following points summarize the major tasks remaining for states that are interested in implementing the UPRM.

State Assessment of Interest

Each state must decide whether or not it is interested in pursuing production systems based on the UPRM concepts. This decision should be made carefully, after considering both the costs and benefits of an implementation.

Identification of Relevant Uniformity Guidelines. Each state will need to identify those guidelines that are relevant to its situation. Some guidelines, because of statutory or state-specific industry concerns, may not be appropriate for implementation in a particular state. Each state will need to identify only those that are relevant or partially relevant before proceeding to the next step.

Cost/Benefit Analysis. Once the relevant list of guidelines has been established, a thorough cost/benefit analysis will need to be performed that accounts for all appropriate costs and all expected benefits. This analysis should consider costs to the state and federal governments, as well as costs to industry. The results of this cost/benefit analysis will support state agency experts in their assessment of how to proceed.

Development of State/Industry Task Force

Assuming a state is interested, it should proceed with formalizing its strategic approach to the effort. Specific steps might include the identification of key industry players, since any statewide effort requiring significant change on the part of industry can best succeed if it seeks the advice and support of appropriate industry leaders. Close cooperation between state and industry can only enhance the quality of the solution for all concerned. Once the key industry representatives have been identified and the task force established, it is important that the scope of the task force's duties and its specific responsibilities be defined. Such definition will support the spirit of cooperation and will ensure success.

Solicitation of State Support

State-level support for an initiative of this nature will be crucial. The agency(ies) involved in this process should solicit the support of other agencies and key legislators.

Solicitation of Federal Assistance

Assuming DOE has funded the State Upgrade Program, it should have means for assisting states as they upgrade their systems. Appropriate steps should be taken to understand the process for obtaining these funds and this process should begin.

VI. CONCLUSION

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CONCLUSION

Nationwide Implementation is Feasible

The original project charge was to investigate the feasibility of developing a conceptual model for nationwide use in gathering production data. Such an implementation is indeed possible, and many states are interested in adopting the guidelines outlined by the UPRM Conceptual Model. At the same time, states are under increasing budgetary pressure and will have little or no funding available for unilateral upgrades of state systems. For that reason, federal assistance to producing states will be essential for nationwide adoption of the UPRM.

Implementation is Urgent

A window of opportunity for natural gas to become a premier energy source in the United States is present today, but without decisive action, that window could close. The primary barrier to widespread use of natural gas is its perceived lack of supply reliability. This perceived lack of reliability is due mainly to the lack of timely and accurate production and deliverability information. Inadequate deliverability data and inadequate supply information can cause artificial price volatility; this can negatively impact producers' decisions to drill and to further expand the nation's resources into productive reserves. Since reserve increases will come only through increased drilling, the widespread implementation of a uniform production reporting system such as the UPRM improves resource supply planning, which increases opportunities for new drilling. Patchwork revamping of state systems may deplete available state funds without providing national benefits. Recurring themes surrounding the natural gas industry and production data can be summarized as follows:

- The natural gas is increasingly dependent upon timely and accurate production information.
- At the same time, producing state agencies are increasingly unable to provide that data.

These two problems share a common solution that centers on the implementation of nationally standard uniform production reporting.

Benefits of Implementation

The ultimate beneficiary of improved production data is the consumer of natural gas. Benefits will accrue through reduced price risk and increased availability of domestically abundant and environmentally benign natural gas.

Producing states will also benefit from the adoption of UPRM in that these states will have better control over gas and oil resources and will benefit from cross-agency sharing of data. The federal government will benefit from improved data for policy making and from increased royalties for managing public and Indian lands.

The nation will benefit from a stronger, more competitive gas industry. As consumer confidence grows, the demand for natural gas will increase, and the natural gas industry will expand. This will result in increased employment, increased research and development investments, increased conversion of the nation's domestic resources into productive reserves, and an overall positive impact on the nation's economy.

The Conceptual Model is Only the First Step

The UPRM is only the first step in the process of realizing the benefits of nationally uniform production data. It is now up to the state and federal governments to capitalize on the extensive knowledge captured through this effort. The UPRM initiative has required the close cooperation of representatives from state governments, industry, and the federal government. This cooperation will be essential for the long-term benefit of the consumer through nationally standard production data.

Finally, the DOE is in a unique position to build the required momentum to ensure the success of the UPRM. It can do this by adopting it as the basis of its State Upgrade Program that it introduced in *The 1993 Domestic Natural Gas and Oil Initiative*, Action 3.1 Upgrade State Data Collection and Reporting on Natural Gas Production.

LIST OF ACRONYMS AND ABBREVIATIONS

AGA	American Gas Association
API	American Petroleum Institute
ASC	Accredited Standards Committee
BLM	Bureau of Land Management
BOE	Barrel of Oil Equivalent
BTU	British Thermal Unit
COPAS	Council of Petroleum Accountants Societies
DoD	United State Department of Defense
DOE	United States Department of Energy
DTF	Deliverability Task Force
EBB	Electronic Bulletin Board
EDI	Electronic Data Interchange
EIA	Energy Information Administration
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
GIS	Geographical Information System
GISB	Gas Industry Standards Board
GPS	Global Positioning System
INGAA	Interstate Natural Gas Association of America
IOGCC	Interstate Oil and Gas Compact Commission
IPAA	Independent Petroleum Association of America
LDC	Local Distribution Company
MCF	Thousand Cubic Feet
MMS	Minerals Management Service
NARO	National Association of Royalty Owners
NARUC	National Association of Regulatory Utility Commissioners
NGSA	Natural Gas Supply Association
OIPA	Oklahoma Independent Petroleum Association
OU	University of Oklahoma
PIDX	Petroleum Information Data Exchange
PUC	Public Utility Commission
UPRM	Uniform Production Reporting Model
UTM	Universal Transverse Mercator

APPENDIX A

SECTION 1

Business Events Flow Documents

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Overview

The *Lease State Land* business event begins with the initial bidding process and proceeds through the granting of a state lease.

Uniformity Guidelines**Reference and Relationship**

R-3.....A standard Business Associate code is used by the Conservation, Tax and Royalty Agencies.

Timing and Content

None defined

Communication

C-5The use of electronic forms of communication is supported by a state.

Validation and Verification

None defined

Data Sharing

None defined

Assumptions

- The Royalty agency maintains the state lease and lessee information.

Name	Description	Functions Used
Set Up Initial State Lease Information	Establishes the lease.	Registration & Relationship Maintenance
Capture State Lease Agreement	Captures and tracks the signed lease agreement.	Data Capture and Validation
Update Lessee's Business Associate Information	If the lessee has no Business Associate code, one is assigned. The Business Associate role is set to "State Lessee".	Registration & Relationship Maintenance
Update State Lease Information	Maintains lease information.	Registration & Relationship Maintenance
Link Lessee to Lease	Establishes the link between the lessee and the lease.	Registration & Relationship Maintenance

Overview

The *Permit to Drill* business event begins with the initial application to drill, proceeds through the approval or rejection of the permit and, for approved permits, to the establishment of the API Well Bore Number. The event then ends with the granting of a permit to the operator.

Uniformity Guidelines**Reference and Relationship**

- R-1..... A standard API Well Bore Number is used.
- R-3..... A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-4..... Well bores are linked to operators on an effective-dated basis and the links are stored in a common database.

Timing and Content

None defined

Communication

- C-1 Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-2 Information can be received by a state via magnetic media.
- C-3 Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-4 Information can be transmitted from state agencies via magnetic media.
- C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

None defined

Data Sharing

None defined

Assumptions

- The Conservation agency assigns the API Well Bore Number and maintains all well bore information.
- The Conservation agency maintains operator Business Associate information.

Name	Description	Functions Used
Capture Permit to Drill Application Information	Captures permit application information from the operator. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Evaluate Permit to Drill Application	Ensures that statutory regulations, such as spacing, bonding requirements, etc. are being followed, and that conservation technical factors have been considered.	Permitting Bonding
Approve Permit to Drill Application and Update Permit Status	Updates the status of the Permit to <i>approved</i> .	Permitting
Assign API Well Bore Number	Assigns an API Well Bore Number to the permit and updates the Well Bore file.	Registration and Relationship Maintenance
Update Operator's Business Associate Information	If the operator has no Business Associate code, one is assigned. The Business Associate role is set to "Operator".	Registration and Relationship Maintenance
Link Well Bore to Operator	Establishes the relationship between the well bore and the operator.	Registration and Relationship Maintenance
Reject Permit to Drill Application and Update Permit Status	Updates the status of the Permit to <i>rejected</i> .	Permitting
Notify Operator	Notifies the operator of the approval or the rejection of the permit. If the permit to drill is approved, the operator will also be notified of the API Well Bore Number. The appropriate information will be sent to Correspondence Management for processing.	Permitting Correspondence Management

Overview

The *Permit to Perforate and/or Completion Report* business event begins with either a permit to perforate or a completion report, proceeds through the assignment of a well completion number and recognition of the new completion by the Royalty agency and Tax agency.

Uniformity Guidelines

Reference and Relationship

- R-1.....A standard API Well Bore Number is used.
- R-2.....A STATE standard code is used to identify each well completion within each well bore.
- R-3.....A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-4.....Well bores are linked to operators on an effective-dated basis and the links are stored in a common database.
- R-5.....Well completions are linked to state leases on an effective-dated basis and the links are stored in a common database.
- R-6.....Well completions are linked to tax groups on an effective-dated basis and the links are stored in a common database.
- R-11.....A standard location X-Y-Z coordinate system (e.g. latitude/longitude/elevation) is used to identify the location of each well or transaction point.

Timing and Content

None defined

Communication

- C-1Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-2Information can be received by a state via magnetic media.
- C-3Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-4Information can be transmitted from state agencies via magnetic media.
- C-5The use of electronic forms of communication is supported by a state.

Validation and Verification
None defined

Data Sharing
None defined

Assumptions

- The Conservation agency assigns the well completion code and maintains the well completion information.
- The Royalty agency links well completions to state leases.
- The Tax agency links well completions to tax groups.

C. Permit to Perforate¹
and/or Completion Report²

Business Event Flow

**If not included in Permit to Drill*

**C. Permit to Perforate¹
and/or Completion Report²**

Business Event Flow

**C. Permit to Perforate¹
and/or Completion Report²**

Business Event Flow

**C. Permit to Perforate¹
and/or Completion Report²**

Business Event Flow

C. Permit to Perforate and/or Completion Report

Process Description

Name	Description	Functions Used
Capture Permit to Perforate Application Information	Captures permit information from the operator. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Evaluate Permit to Perforate Application	Evaluates the permit to ensure that statutory regulations, such as spacing, are being followed and that conservation technical factors have been reviewed.	Permitting Bonding
Approve Permit to Perforate and Update Permit Status	Updates the status of the permit to <i>approved</i> .	Permitting
Reject Permit to Perforate and Update Permit Status	Updates the status of the permit to <i>rejected</i> .	Permitting
Notify Operator	Notifies the operator of the approval or the rejection of the permit. The appropriate information will be sent to Correspondence Management for processing.	Permitting Correspondence Management
Capture Completion Report Information	Captures and validates completion report information. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Assign Well Completion Code and Update Information	This process will occur upon receipt of a completion report from an operator. A well completion code will be assigned and updated on the Well Completion file. This information then becomes available for Royalty and Tax processing.	Registration and Relationship Maintenance
Link Well Completion to Well Bore	Establishes the relationship between the well completion and the well bore.	Registration and Relationship Maintenance
Update Operator's Business Associate Information	If the operator has no Business Associate code, one is assigned. The Business Associate role is set to "Operator".	Registration and Relationship Maintenance

C. Permit to Perforate and/or Completion Report

Process Description

Name	Description	Functions Used
Update Well Bore to Operator Link	Establishes or updates the link between the well bore and the operator.	Registration and Relationship Maintenance
Issue Completion Notice with Well Completion Code	Notifies the operator of the registration of the well completion and of the assigned well completion code. The appropriate information will be sent to Correspondence Management for processing.	Permitting Correspondence Management
Identify Well Completions on State Leases	Royalty agency will identify new well completions and determine whether or not the well completion is on a state lease.	State Lease Management
Link Well Completion to State Lease	If the well completion is on a state lease, the relationship between the state lease and the well completion is established or updated.	Registration and Relationship Maintenance
Issue Royalty Remitter Identification Form to Lessee	The lessees of the lease will receive a request for identification of royalty remitters. The appropriate information will be sent to Correspondence Management for processing.	State Lease Management Correspondence Management
Capture Royalty Remitter(s) Identification Form	When the remitter identification form is received from the lessee, the remitter information is captured by the system. The Remitter identification form could be a copy of the Division Order.	Data Capture and Validation
Update Royalty Remitter(s) Business Associate Information	If the payee has no Business Associate code, one is assigned. The Business Associate role is set to "Royalty Remitter".	Registration and Relationship Maintenance

C. Permit to Perforate and/or Completion Report

Process Description

Name	Description	Functions Used
Notify Remitters	Notifies the royalty remitters that they are responsible for royalty payments on the state lease. The appropriate information will be sent to Correspondence Management for processing.	State Lease Management Correspondence Management
Identify New Well Completions	The Tax agency will be able to identify new well completions in order to determine if the well completions should be assigned to new or existing tax groups.	Tax Group Management
Update Tax Group and Tax Exemptions	If a new tax group is needed, it is established. Existing tax groups also may be modified. Tax exemptions also are established or updated.	Registration and Relationship Maintenance
Link Well Completion to Tax Group	The relationship between the well completion and the tax group is established or updated.	Registration and Relationship Maintenance
Issue Tax Remitter Identification Form to Operator	The operator of the well completion will receive a request for identification of tax remitters. The appropriate information will be sent to Correspondence Management for processing.	Tax Group Management Correspondence Management
Capture Tax Remitter(s) Identification	When the tax remitter identification form is received from the operator, the remitter information is captured by the system.	Data Capture and Validation
Update Tax Remitter(s) Business Associate Information	If the tax remitter has no Business Associate code, one is assigned. The Business Associate role is set to "Tax Remitter". Also, the designated tax remitters are checked to ensure that they are bonded as required by statutory regulations.	Registration and Relationship Maintenance

**C. Permit to Perforate
and/or Completion Report**

Process Description

Name	Description	Functions Used
Notify Tax Remitter(s)	Notifies the tax remitters that they are responsible for tax payments for the well completion. The appropriate information will be sent to Correspondence Management for processing.	Tax Group Management Correspondence Management
Issue Clearance to Remove Product	The operator will receive clearance to remove product from the well completion. The appropriate information will be sent to Correspondence Management for processing.	Tax Group Management Correspondence Management

Overview

The *Maintain Well Relationships* business event is vital in maintaining the relationships between entities. This event may be initiated by either the reporter or agency.

Uniformity Guidelines**Reference and Relationship**

- R-1..... A standard API Well Bore Number is used.
- R-2..... A STATE standard code is used to identify each well completion within each well bore.
- R-3..... A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-4..... Well bores are linked to operators on an effective-dated basis and the links are stored in a common database.
- R-6..... Well completions are linked to tax groups on an effective-dated basis and the links are stored in a common database.
- R-9..... Transaction points are identified using a standard numbering system.
- R-10..... Well completions are linked to transaction points on an effective-dated basis and the links are stored in a common database.

Timing and Content

None defined

Communication

- C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

None defined

Data Sharing

None defined

Assumptions

- The Conservation agency maintains the well completion to transaction point link information.

Name	Description	Functions Used
Capture Information	The Tax agency captures information regarding changes in the well completion that relate to tax groups. The information may be provided by the reporter of production-related data or may originate from the Tax agency itself due to new tax laws or regulations. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Update Tax Group and Tax Exemptions	If a new tax group is needed, it is established. Existing tax groups also may be modified. Tax exemptions may be established or updated.	Registration and Relationship Maintenance
Update Well Completion to Tax Group Link	Establishes or updates the relationship between the well completion and the tax group.	Registration and Relationship Maintenance
Capture Information	The Conservation agency captures information regarding changes in well completion that relate to operation of the well (e.g. change in operator) or to transaction points. The information may be provided by the operator of the well or the reporter of production-related data or may originate from the Conservation agency itself. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Update Operator's Business Associate Information	If the new operator has no Business Associate code, one is assigned. The Business Associate role is set to "Operator".	Registration and Relationship Maintenance

Name	Description	Functions Used
Update Well Bore to Operator Link	Updates the link between the well bore and the operator	Registration and Relationship Maintenance
Update Transaction Point Information	If the new transaction point has no transaction point number, one is assigned. Information for existing transaction points is updated.	Registration and Relationship Maintenance
Update Well Completion to Transaction Point Link	Updates the link between the well completion and the transaction point	Registration and Relationship Maintenance

Overview

The *Unitize* business event begins with either a voluntary or compulsory unitization, proceeds through the linking of well completions to the new unit, and the recognition of the new unit by the Tax and Royalty agencies.

Uniformity Guidelines**Reference and Relationship**

- R-1..... A standard API Well Bore Number is used.
- R-2..... A STATE standard code is used to identify each well completion within each well bore.
- R-3..... A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-4..... Well bores are linked to operators on an effective-dated basis and the links are stored in a common database.
- R-5..... Well completions are linked to state leases on an effective-dated basis and the links are stored in a common database.
- R-6..... Well completions are linked to tax groups on an effective-dated basis and the links are stored in a common database.
- R-8..... Well completions are linked to units on an effective-dated basis and the links are stored in a common database.

Timing and Content

None defined

Communication

- C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

None defined

Data Sharing

None defined

Assumptions

- The Conservation agency links the well completions to units.
- The Royalty agency links well completions to state leases for well completions in newly-defined units.
- The Tax agency links well completions to tax groups for well completions in newly-defined units.

**includes compulsory and voluntary unitizations*

Name	Description	Functions Used
Capture Unit Agreement	Captures unit agreement from the initial source.	Data Capture and Validation
Assign Unit Number	When a unit is established, the Conservation agency will assign the unit number and update unit information. This information will be available to the Tax and Royalty agencies.	Registration and Relationship Maintenance
Link Well Completions to Unit	Establishes the relationship between well completions and the unit.	Registration and Relationship Maintenance
Issue Notice of Unitization with Unit Number	Notifies the operator that the unit has been established. The appropriate information is sent to Correspondence Management for processing.	Unitization Correspondence Management
Identify New Unit	Tax agency will identify new units in order to determine if a new tax group number needs to be established for the well completions within the unit.	Tax Group Management
Assign Tax Group and Tax Exemptions	If needed, a new tax group is established for the well completions within the unit. Existing tax groups may be updated. Tax exemptions may be established or updated.	Registration and Relationship Maintenance
Link Well Completion to Tax Group	The relationship between well completions and the tax group are established or updated.	Registration and Relationship Maintenance
Issue Tax Remitter Identification Form to Operator	The operator of the unit will receive a request for identification of tax remitters. The appropriate information will be sent to Correspondence Management for processing.	Tax Group Management Correspondence Management
Capture Tax Remitter(s) Identification Form	Capture tax remitter identification information	Data Capture and Validation

Name	Description	Functions Used
Update Tax Remitter(s) Business Associate Information	If the tax remitter has no Business Associate code, one is assigned. The Business Associate role is set to "Tax Remitter." Also, the designated tax remitters are checked to ensure that they are bonded as required by statutory regulations.	Registration and Relationship Maintenance Bonding
Notify Tax Remitter(s)	The tax remitter(s) will receive notification that they have been designated responsible for tax payments for the well completions within the unit. The appropriate information will be sent to Correspondence Management for processing.	Tax Group Management Correspondence Management
Identify New Unit	Royalty agency will identify new units in order to determine if well completions in the new unit are on state leases.	State Lease Management
Link Well Completion to State Lease	The relationship between the well completions and the state lease is established or updated.	Registration and Relationship Maintenance
Issue Royalty Remitter Identification Form to Lessee	The lessees of the unit will receive a request for identification of royalty remitters. The appropriate information will be sent to Correspondence Management for processing.	State Lease Management Correspondence Management
Capture Royalty Remitter(s) Identification Form	Capture Royalty Remitter identification information	Data Capture and Validation
Update Royalty Remitter(s) Business Associate Information	If the royalty remitter has no Business Associate code, one is assigned. The Business Associate role is set to "Royalty Remitter." Also, the designated royalty remitters are checked to ensure that they are bonded as required by statutory regulations.	Registration and Relationship Maintenance Bonding

	Name	Description	Functions Used
	Notify Royalty Remitters	The royalty remitters will receive notification that they have been designated responsible for royalty payments for the well completions within the unit. The appropriate information will be sent to Correspondence Management for processing.	State Lease Management Correspondence Management

Overview

The *Process Well Test* business event begins with the capture of well test information and proceeds through the validation of the data.

Uniformity Guidelines**Reference and Relationship**

- R-1..... A standard API Well Bore Number is used.
- R-2..... A STATE standard code is used to identify each well completion within each well bore.
- R-3..... A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.

Timing and Content

- TC-1..... Well test information is provided at the well completion level for all tested hydrocarbons and is stored in a common database.

Communication

- C-1 Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-2 Information can be received by a state via magnetic media.
- C-3 Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-4 Information can be transmitted from state agencies via magnetic media.
- C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

- V-1 Each agency will internally validate and verify data to meet minimum data quality standards. Error statements will be returned to the reporters of the data.

Data Sharing

None defined

Assumptions

- The Conservation agency receives well test information.

Name	Description	Functions Used
Capture Well Test Data	Captures well test and inspection information from the initial source. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation Well Test
Validate Well Test Information	Validates the well test information for edit checks such as: <ul style="list-style-type: none">• required data provided• numeric/alphanumeric• etc.	Data Capture and Validation
Notify Operator of Exceptions	Notifies the operator of errors or exceptions on well test data. The appropriate information is sent to Correspondence Management for processing.	Data Capture and Validation Correspondence Management

Overview

The *Set Allowables* business event begins with the calculation of allowables based on well test data, production history, and conservation technical factors and proceeds through the generation of operator allowable schedules.

Uniformity Guidelines**Reference and Relationship**

R-1..... A standard API Well Bore Number is used.

R-2..... A STATE standard code is used to identify each well completion within each well bore.

R-7..... Well completions are linked to their appropriate production allowables.

Timing and Content

None identified

Communication

C-3 Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.

C-4 Information can be transmitted from state agencies via magnetic media.

C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

None defined

Data Sharing

None defined

Assumptions

- The Conservation agency defines allowables, when required by statute.

Name	Description	Functions Used
Automatically Calculate Allowables	Generates allowables based on well test data, production information (both current and historical), and conservation technical factors.	Allowables
Modify Allowables	Once the allowables are set, they can be reviewed and adjusted as required by changes in the well test data, production information and conservation technical factors.	Allowables
Generate Operator Allowables Schedules	Allowables schedules will be sent to operators. The appropriate information will be sent to Correspondence Management for processing.	Allowables Correspondence Management

Overview

The *Process Conservation Volumes* business event begins with the capture of production volumes reported to the Conservation agency, proceeds through validation of those volumes and a comparison to allowables.

Uniformity Guidelines**Reference and Relationship**

- R-1..... A standard API Well Bore Number is used.
- R-2..... A STATE standard code is used to identify each well completion within each well bore.
- R-3..... A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-9..... Transaction points are identified using a standard numbering system.

Timing and Content

- TC-2..... Production volumes are reported for each separately measured well completion with the transaction point identified.
- TC-5..... Production, Tax and Royalty volume information is reported for all commercial hydrocarbons.
- TC-7..... Conservation volume information is received as soon as possible, but no later than the last day of the month following the month of production.
- TC-9..... Information can be received and processed at any time prior to the due-date.
- TC-10... Incentives and other programs are used to encourage timely and accurate reporting of information.
- TC-12... Routine reporting requirements will include a provision for volume information to be reported by at least two parties with separate interests.

Communication

- C-1 Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-2 Information can be received by a state via magnetic media.

Communication (continued)

- C-3 Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-4 Information can be transmitted from state agencies via magnetic media.
- C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

- V-1 Each agency will internally validate and verify data to meet minimum data quality standards. Error statements will be returned to the reporters of the data.

Data Sharing

None defined

Assumptions

- The Conservation agency receives production volumes.

H. Process

Conservation Volumes

Process Description

Name	Description	Functions Used
Capture Volumes	Captures production volumes from the initial source. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Validate Production Volumes	Performs initial data validations including checking data type, data formatting and required data fields.	Data Capture and Validation
Notify Reporter of Exceptions	Provides feedback to reporters about data errors.	Data Capture and Validation Correspondence Management
Process Volumes Against Allowables	Monitors reported gas and oil production volumes to ensure that production volumes do not exceed defined allowables. Also adjusts allowables net balance to reflect reported production volumes.	Allowables
Notify Reporter of Allowables Overage or Underage	Provides feedback to reporters about production that exceeds allowable levels.	Allowables Correspondence Management

Overview

The *Process Tax Volumes and Values* business event begins with the capture of tax volumes, values, and payments, proceeds through the validation of these data and the comparison of check summary information to supporting detail information.

Uniformity Guidelines

Reference and Relationship

- R-3..... A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-9..... Transaction points are identified using a standard numbering system.

Timing and Content

- TC-3..... Tax volumes and values are reported at the tax group level with the transaction point identified.
- TC-5..... Production, Tax and Royalty volume information is reported for all commercial hydrocarbons.
- TC-6..... Tax and Royalty value information is reported for all commercial hydrocarbon products severed or sold.
- TC-8..... Tax and Royalty volume and value information is received as soon as possible, but no later than the last day of the second month following the month of production.
- TC-9..... Information can be received and processed at any time prior to the due-date.
- TC-10... Incentives and other programs are used to encourage timely and accurate reporting of information.
- TC-11... All volume dispositions are accounted for from the Production transaction point to the Tax or Royalty transaction point.
- TC-12... Routine reporting requirements will include a provision for volume information to be reported by at least two parties with separate interests.

Communication

- C-1Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-2Information can be received by a state via magnetic media.
- C-3Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-4Information can be transmitted from state agencies via magnetic media.
- C-5The use of electronic forms of communication is supported by a state.

Validation and Verification

- V-1Each agency will internally validate and verify data to meet minimum data quality standards. Error statements will be returned to the reporters of the data.

Data Sharing

None defined

Assumptions

- The Tax agency receives tax volumes and values.

**includes gross taxable and non-taxable volumes and values*

**Remitter will send either a hardcopy payment or an EFT through their bank*

**I. Process Tax
Volumes and Values**

Process Description

Name	Description	Functions Used
Capture Volumes and Values	Captures Tax volumes and values from the initial source. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Update Transaction Point Information	If a new transaction point is identified on the volume report, a transaction point record is established, and a new transaction point number is assigned.	Registration and Relationship Maintenance
Validate Volumes and Values	Performs initial data validations including checking data type, data formatting, footing, required data fields, etc.	Data Capture and Validation
Notify Reporter or Remitter of Exceptions	Provides feedback to the reporter or remitter about data errors.	Data Capture and Validation Correspondence Management
Match Volumes and Values to Payments	Compares gas and oil volumes and values to tax payments received.	Remittance Processing

Overview

The *Process Royalty Volumes and Values* business event begins with the capture of royalty volumes, values and payments from state leases, proceeds through the validation of these data and the comparison of check summary information to supporting detail information.

Uniformity Guidelines

Reference and Relationship

- R-3.....A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-9.....Transaction points are identified using a standard numbering system.

Timing and Content

- TC-4.....Royalty volumes and values are reported at the state lease level with tax group and transaction point identified.
- TC-5.....Production, Tax and Royalty volume information is reported for all commercial hydrocarbons.
- TC-6.....Tax and Royalty value information is reported for all commercial hydrocarbon products severed or sold.
- TC-8.....Tax and Royalty volume and value information is received as soon as possible, but no later than the last day of the second month following the month of production.
- TC-9.....Information can be received and processed at any time prior to the due-date.
- TC-10...Incentives and other programs are used to encourage timely and accurate reporting of information.
- TC-11 ...All volume dispositions are accounted for from the Production transaction point to the Tax or Royalty transaction point.
- TC-12...Routine reporting requirements will include a provision for volume information to be reported by at least two parties with separate interests.

Communication

- C-1Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-2Information can be received by a state via magnetic media.
- C-3Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-4Information can be transmitted from state agencies via magnetic media.
- C-5The use of electronic forms of communication is supported by a state.

Validation and Verification

- V-1Each agency will internally validate and verify data to meet minimum data quality standards. Error statements will be returned to the reporters of the data.

Data Sharing

None defined

Assumptions

- The Royalty agency receives royalty volumes and values from state leases.

**includes exempt and non-exempt royalty volumes and values from state leases*

**Remitter will send either a hardcopy payment or an EFT through their bank*

**J. Process Royalty
Volumes and Values**

Process Description

Name	Description	Functions Used
Capture Volumes and Values	Captures Royalty volumes and values from the initial source. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Update Transaction Point Information	If a new transaction point is identified on the volume report, a transaction point record is established, and a new transaction point number is assigned.	Registration and Relationship Maintenance
Validate Volumes and Values	Performs initial data validations including checking data type, data formatting, footing, required data fields, etc.	Data Capture and Validation
Notify Reporter or Remitter of Exceptions	Provides feedback to reporter or remitter about data errors.	Data Capture and Validation Correspondence Management
Match Volumes and Values to Payments	Compares gas and oil volumes and values to royalty payments received from state leases.	Remittance Processing

Overview

The *Cross-Agency Verification* business event begins with the comparison of Conservation, Royalty and Tax volumes, proceeds through comparison of Royalty and Tax values, and ends with the routing of exceptions to the appropriate agencies.

Uniformity Guidelines**Reference and Relationship**

- R-1..... A standard API Well Bore Number is used.
- R-2..... A STATE standard code is used to identify each well completion within each well bore.
- R-3..... A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-5..... Well completions are linked to state leases on an effective-dated basis and the links are stored in a common database.
- R-6..... Well completions are linked to tax groups on an effective- dated basis and the links are stored in a common database.
- R-9..... Transaction points are identified using a standard numbering system.
- R-10..... Well completions are linked to transaction points on an effective-dated basis and the links are stored in a common database.

Timing and Content

None defined

Communication

- C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

- V-2 Conservation, Tax and Royalty agencies will cross-verify volume data.
- V-3 Tax and Royalty agencies will cross-verify value data.
- V-4 States will develop cross-agency verification procedures for handling exceptions and for resolving data discrepancies between agencies.
- V-5 Cross-agency data verification will begin no later than six months after the month of production.

Data Sharing

None defined

Assumptions

- None defined

Name	Description	Functions Used
Volume Analysis	Compares Conservation, Tax and Royalty agencies volume information to ensure that accurate and consistent volume information is being provided and to identify data discrepancies.	Volume Analysis
Route Exceptions to Appropriate Agencies	Routes exception reports to the appropriate regulatory agency for review and audit, if necessary.	Volume Analysis Audit
Value Analysis	Compares Tax and Royalty agencies value information to ensure that accurate and consistent value information is being provided and to identify data discrepancies.	Value Analysis
Route Exceptions to Appropriate Agencies	Routes exception reports to the appropriate regulatory agency for review and audit, if necessary.	Value Analysis Audit

Overview

The *External Data Sharing* business event outlines the types of data being provided, as well as the mechanisms for sharing those data with the data user community outside of the Conservation, Royalty and Tax agencies.

Uniformity Guidelines**Reference and Relationship**

R-1..... A standard API Well Bore Number is used.

R-2..... A STATE standard code is used to identify each well completion within each well bore.

Timing and Content

None defined

Communication

C-1 Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.

C-2 Information can be received by a state via magnetic media.

C-3 Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.

C-4 Information can be transmitted from state agencies via magnetic media.

C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

None defined

Data Sharing

Volume data provided includes:

- S-1 Well Tests
- S-2 Allowables
- S-3 Production Volumes
- S-4 Tax Volumes
- S-5 Royalty Volumes

Value data provided includes:

- S-6 Tax Values and Value Basis
- S-7 Royalty Values and Value Basis

Data Sharing (continued)

Reference data provided includes:

- S-8 Well Completion
- S-9 Well Bore
- S-10 Unit
- S-11 State Lease
- S-12 Business Associate
- S-13 Tax Group

Relationship data provided includes:

- S-14 Well Completion to Well Bore Link
- S-15 Well Completion to Unit Link
- S-16 Well Completion to Tax Group Link
- S-17 Well Completion to State Lease Link
- S-18 Well Completion to Transaction Point Link

Information is provided to the data user via:

- S-19 Electronic Data Interchange (EDI)
- S-20 Magnetic Media
- S-21 On-line Inquiry
- S-22 Paper Reports
- S-23 CD-ROM

- S-24 Validated data should be released in a timely manner no later than one month after they are received by the agency.
- S-25 Data will be provided to data users in standard output formats.
- S-26 Statistics will be provided to data users as a measure of data completeness.
- S-27 In-process data discrepancies are identified for data users.

Assumptions

- Pressure and temperature bases are defined clearly for the data user.

Name	Description	Functions Used
Process Request	Processes requests for production-related information. Output may be obtained via on-line inquiry, hard copy reports, diskettes, tapes, EDI or CD-ROM .	External Data Sharing Remittance Processing

Overview

The *Permit to Abandon* business event begins with the original receipt of the application for abandonment permit and proceeds through the update of all appropriate reference and relationship databases.

Uniformity Guidelines**Reference and Relationship**

- R-1..... A standard API Well Bore Number is used.
- R-2..... A STATE standard code is used to identify each well completion within each well bore.
- R-3..... A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.
- R-4..... Well bores are linked to operators on an effective-dated basis and the links are stored in a common database.

Timing and Content

None defined

Communication

- C-1 Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-2 Information can be received by a state via magnetic media.
- C-3 Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.
- C-4 Information can be transmitted from state agencies via magnetic media.
- C-5 The use of electronic forms of communication is supported by a state.

Validation and Verification

None defined

Data Sharing

None defined

Assumptions

- None defined

Name	Description	Functions Used
Capture Permit to Abandon Application Information	Captures Permit Application information from the initial source. Data may be entered via EDI, magnetic media (diskette or tape) or manual data entry.	Data Capture and Validation
Evaluate Permit to Abandon Application	Ensures that statutory regulations, such as environmental plans, etc. are being followed.	Permitting
Approve Permit to Abandon and Update Permit Status	Updates the status of the Permit to <i>approved</i> .	Permitting
Reject Permit to Abandon and Update Permit Status	Updates the status of the Permit to <i>rejected</i> .	Permitting
Notify Operator	Notifies the operator of the approval or the rejection of the permit application. The appropriate information will be sent to Correspondence Management for processing.	Permitting Correspondence Management
Oversee Plugging	Ensures that statutory regulations are followed during the plugging and abandonment process.	Permitting
Update Operator's Business Associate Information	Change operator's Business Associate role when necessary.	Registration and Relationship Maintenance Bonding
Update Well Bore Information	Updates the Well Bore status to plugged and abandoned.	Registration and Relationship Maintenance
Update Well Bore to Operator Link	Updates the effective-dated relationship between Well Bore and Operator.	Registration and Relationship Maintenance
Update Well Completion to Transaction Point Link	Updates the effective-dated relationship between Well Completion and Transaction Point.	Registration and Relationship Maintenance
Update Well Completion to Tax Group Link	Updates the effective-dated relationship between Well Completion and Tax Group.	Registration and Relationship Maintenance
Update Tax Group	Reviews the status of the tax group, and updates tax group information when necessary.	Registration and Relationship Maintenance

Name	Description	Functions Used
Update Tax Remitter's Business Associate Information	Reviews the status of the tax remitter, and updates tax remitter's Business Associate information when necessary.	Registration and Relationship Maintenance
Update Well Completion to State Lease Link	Updates the effective-dated relationship between Well Completion and State Lease.	Registration and Relationship Maintenance
Update State Lease	Reviews the status of the state lease, and updates state lease information when necessary.	Registration and Relationship Maintenance
Update Royalty Remitter's Business Associate Information	Reviews the status of the royalty remitter, and updates the royalty remitter's Business Associate information when necessary.	Registration and Relationship Maintenance

Appendix A

Section 1

Business Events

Core Business Event/Uniformity Guideline Cross-Reference

Core Business Events/ Uniformity Guideline Cross-Reference

Uniformity Guidelines		Business Events												
		A	B	C	D	E	F	G	H	I	J	K	L	M
#	Name	Lease State Land	Permit to Drill	Permit or Compltn Report	Maintain Well Reltnship		Process Well Test	Set Allwbls	Process Consvn Vols	Process Tax Vols & Vals	Process Roy Vols & Vals	Cross- Agency Verfcn	External Data Sharing	Permit to Abandon

Reference and Relationship - Continued

R-10	Well completions are linked to transaction points on an effective-dated basis and the links are stored in a common database.				X							X		
R-11	A standard location X-Y-Z coordinate system (e.g. latitude/longitude/elevation) is used to identify the location of each well or transaction point.			X										

Core Business Events/ Uniformity Guideline Cross-Reference

Business Events

Uniformity Guidelines

#	Name	A	B	C	D	E	F	G	H	I	J	K	L	M
		Lease State Land	Permit to Drill	Permit or Compltn Report	Maintain Well Reltnshp	Unitize	Process Well Test	Set Allwbls	Process Consvn Vols	Process Tax Vols & Vals	Process Roy Vols & Vals	Cross- Agency Verfcn	External Data Sharing	Permit to Abandon

Timing and Content

TC-1	Well test information is provided at the well completion level for all tested hydrocarbons and is stored in a common database.						X							
TC-2	Production volumes are reported for each separately measured well completion with the transaction point identified.								X					
TC-3	Tax volumes and values are reported at the tax group level with the transaction point identified.									X				
TC-4	Royalty volumes and values are reported at the state lease level with tax group and transaction point identified.										X			
TC-5	Production, Tax and Royalty volume information is reported for all commercial hydrocarbons.								X	X	X			
TC-6	Tax and Royalty value information is reported for all commercial hydrocarbon products severed or sold.									X	X			
TC-7	Conservation volume information is received as soon as possible, but no later than the last day of the month following the month of production.								X					

Core Business Events/ Uniformity Guideline Cross-Reference

		Business Events												
Uniformity Guidelines		A	B	C	D	E	F	G	H	I	J	K	L	M
#	Name	Lease State Land	Permit to Drill	Permit or Compltn Report	Maintain Well Reltnship		Process Well Test	Set Allwbls	Process Consvn Vols	Process Tax Vols & Vals	Process Roy Vols & Vals	Cross- Agency Verfen	External Data Sharing	Permit to Abandon

Timing and Content - Continued

TC-8	Tax and Royalty volume and value information is received as soon as possible, but no later than the last day of the second month following the month of production.									X	X			
TC-9	Information can be received and processed at any time prior to the due-date.								X	X	X			
TC-10	Incentives and other programs are used to encourage timely and accurate reporting of information.								X	X	X			
TC-11	All volume dispositions are accounted for from the Production transaction point to the Tax or Royalty transaction point.									X	X			
TC-12	Routine reporting requirements will include a provision for volume information to be reported by at least two parties with separate interests.								X	X	X			

Core Business Events/ Uniformity Guideline Cross-Reference

Business Events

A	B	C	D	E	F	G	H	I	J	K	L	M
Lease State Land	Permit to Drill	Permit or Compltn Report	Maintain Well Relationship	Utilize	Process Well Test	Set Allowb's	Process Consrvn Vols	Process Tax Vols & Vals	Process Roy Vols & Vals	Cross Agency Verfcn	External Data Sharing	Permit to Abandon

Uniformity Guidelines

#	Name
---	------

Communication

C-1	Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.	X	X		X		X	X	X		X	X
C-2	Information can be received by a state via magnetic media.	X	X		X		X	X	X		X	X
C-3	Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.	X	X		X	X	X	X	X		X	X
C-4	Information can be transmitted from state agencies via magnetic media.	X	X		X	X	X	X	X		X	X
C-5	The use of electronic forms of communication is supported by a state.	X	X	X	X	X	X	X	X	X	X	X

Core Business Events/ Uniformity Guideline Cross-Reference

Business Events

Uniformity Guidelines

#	Name
---	------

A	B	C	D	E	F	G	H	I	J	K	L	M
Lease State Land	Permit to Drill	Permit or Complain Report	Maintain Well Relationship	Unitize	Process Well Test	Set Allwbls	Process Conserv Vols	Process Tax Vols & Vals	Process Roy Vols & Vals	Cross-Agency Verfcn	External Data Sharing	Permit to Abandon

Validation and Verification

V-1	Each agency will internally validate and verify data to meet minimum data quality standards. Error statements will be returned to the reporters of the data.				X		X	X				
V-2	Conservation, Tax, and Royalty agencies will cross-verify volume data.									X		
V-3	Tax and Royalty agencies will cross-verify value data.									X		
V-4	States will develop cross-agency verification procedures for handling exceptions and for resolving data discrepancies between agencies.									X		
V-5	Cross-agency data verification will begin no later than six months after the month of production.									X		

Core Business Events/ Uniformity Guideline Cross-Reference

Uniformity Guidelines		Business Events												
		A	B	C	D	E	F	G	H	I	J	K	L	M
		Lease State Land	Permit to Drill	Permit or Compltn Report	Maintain Well Reltnship		Process Well Test	Set Allwbls	Process Consvn Vols	Process Tax Vols & Vals	Process Roy Vols & Vals	Cross- Agency Verfcn	External Data Sharing	Permit to Abandon
#	Name													

Data Sharing - Continued

S-12	Reference data provided includes: Business Associate												X	
S-13	Reference data provided includes: Tax Group												X	
S-14	Relationship data provided includes: Well Completion to Well Bore Link												X	
S-15	Relationship data provided includes: Well Completion to Unit Link												X	
S-16	Relationship data provided includes: Well Completion to Tax Group Link												X	
S-17	Relationship data provided includes: Well Completion to State Lease Link												X	
S-18	Relationship data provided includes: Well Completion to Transaction Point Link												X	
S-19	Information is provided to the end-user via: Electronic Data Interchange (EDI)												X	

Appendix A

Section 2

Uniformity Guidelines

APPENDIX A

SECTION 2

Uniformity Guidelines

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Communication

C-1	Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.	31
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Validation and Verification

V-1	Each agency will internally validate and verify data to meet minimum data quality standards. Error statements will be returned to the reporters of the data.	36
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V-3	Tax and Royalty agencies will cross-verify value data.	38
V-4	States will develop cross-agency verification procedures for handling exceptions and for resolving data discrepancies between agencies.	39
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Data Sharing

Volume data provided includes:

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Reference data provided includes:

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INTRODUCTION

Uniformity Guidelines

The Uniformity Guidelines are specific recommendations for making the processing of gas and oil production-related data more uniform. They were developed to be guidelines only - *not mandates* - and have the following characteristics:

- No recommendations are made regarding which state agency is *responsible* for implementing which guidelines.
- The guidelines are broad strategic approaches to achieving uniformity. Specific standards are mentioned when they seem to be fairly stable and widespread.
- The guidelines are directly related to the processing of volume-related information through state systems. The establishment and maintenance of critical reference data, as well as the processing of transaction data, are included in this scope.
- It is acknowledged that it may be unlikely for any state to adopt all of the guidelines, and that some states may elect to adopt different guidelines.

The Uniformity Guidelines are classified into five different categories, with identification numbers that reflect each category.

- **Reference and Relationship (R-1 through R-11)**
These guidelines assist in the definition and maintenance of key entities and the relationships among entities.
- **Timing and Content (TC-1 through TC-12)**
These guidelines address specific characteristics of the data input to the state agencies. These characteristics include timing intervals, content and data reporting levels.
- **Communication (C-1 through C-5)**
These guidelines specify mechanisms that should be used to enhance the timeliness of receiving and sending data within a state and between the state agencies and industry. Communication accessibility for the resolution of problems, data inquiries, identification of reporting requirements, etc. also is established.

- **Validation and Verification (V-1 through V-5)**
These guidelines specify approaches for validating and verifying volume-related information within a state agency, and cross-verifying volume-related information across state agencies.
- **Data Sharing (S-1 through S-27)**
These guidelines define the types of data to be shared with external data users, including volumes, values and reference/relationship data. Timing for sharing with data users is specified, and a mechanism for identifying data completeness is established.

Implementation Guidelines

Based on input received from state agencies, represented industry groups and other data users, several suggested Implementation Guidelines were developed. These Implementation Guidelines deal specifically with identified issues that should be addressed during the implementation of the Uniform Production Reporting Model.

- A program to define standard data output formats should be developed with state and industry involvement. This effort is required to complete the detail specifications needed to implement Uniformity Guidelines S-25, S-26 and S-27.
- Several processes should take place as states redesign their systems. Ultimately, it is the responsibility of each state to assure that the components of this generalized model are appropriate to their individual state situations.
 - a. States and industry would benefit from the development of *state work groups* to address industry concerns.
 - b. States and industry would benefit from the consolidation of unnecessary duplicate reporting of information.
 - c. States and industry would benefit from the elimination of the reporting of non-relevant information.
 - d. States should perform cost/benefit analyses for the implementation of the Uniformity Guidelines, taking into consideration the economics of implementation costs, ongoing maintenance costs for specific Uniformity Guidelines and any additional industry reporting or transition costs.

UNIFORMITY GUIDELINE DETAILS

The individual Uniformity Guidelines are discussed in detail and are organized by category. The *Type of Guideline* categories include:

- Reference and Relationship
- Timing and Content
- Communication
- Validation and Verification
- Data Sharing

Detail discussions are organized by identifying each guideline's *Purpose and Benefits*, *Coding Options*, *Implementation Options*, and *Discussion Points*. The purpose identifies why each guideline is considered important in achieving uniformity. The resulting benefits of an adopted guideline are discussed. Specific coding options are identified where they seem to be stable and widespread. Possible implementation options for each guideline are discussed where identified. Additional general discussion follows where appropriate.

R-1 A standard API Well Bore Number is used.

Type of Guideline - Reference and Relationship

Purpose and Benefits

The purpose of this guideline is to allow a state to uniquely identify wells within the state using a recognized standard. Use of a common reference number for wells will enable cross-agency comparisons of data. This also would facilitate the processes of data verification and audit, and would ultimately result in better data quality.

Coding Options

- API Well Bore Number

Implementation Options

- All wells in the state
- Currently producing wells

Discussion Points

- The authority and responsibility for API Well Bore Number assignments, including those on federal lands, must be clearly defined within each state.
- Assignment of API Well Bore Numbers to currently producing wells is all that is necessary to meet the UPRM.
- If API Well Bore Numbers are assigned only to currently producing wells, the state must be able to bridge to historical data for processing amendments.

R-2 A STATE standard code is used to identify each well completion within each well bore.

Type of Guideline - Reference and Relationship

Purpose and Benefits

The purpose of this guideline is to enable a state to uniquely identify well completions within the state using a recognized standard. Use of a common reference number for well completions will facilitate cross-agency comparisons of data. This also would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- API Well Completion Number (which includes the API Well Bore Number)
- A combination of the API Well Bore Number and any state unique code (for example, a pool code defined by the state)

Implementation Options

- All wells in the state
- Currently producing wells

Discussion Points

- The authority and responsibility for well completion code assignments, including those on federal lands, must be clearly defined within each state.
- While it is desirable to represent stratigraphic intervals with the well completion code, it might be difficult and costly to implement and manage. Therefore, this guideline does not include the criterion of stratigraphic coding.
- This guideline is not intended to provide for inter-state comparisons at the well completion level.
- Assignments of standard well completion codes to currently producing wells are all that is necessary to meet the UPRM.
- If standard well completion codes are assigned only to currently producing wells, the state must be able to bridge to historical data for processing amendments.
- The definition of a well completion within a well bore is defined by an individual state. For example, states may define the source of commingled production as one completion for reporting purposes.

***R-3 A standard Business Associate code is used by the
Conservation, Tax and Royalty agencies.***

Type of Guideline - Reference and Relationship

Purpose and Benefits

The purpose of this guideline is to enable a state to track information about and transactions received from individual business entities (operators, purchasers, transporters, etc.) across state agencies. Use of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data. In addition, a standard Business Associate code would provide a state with the capability of tracking business affiliate information.

Coding Options

- State unique identification number
- Federal Tax Identification number (FEIN or SSN)
- Dun's+4 number

Implementation Options

- Standard number across state Conservation, Tax and Royalty agencies
- Link between state agency numbers

Discussion Points

- A national standard Business Associate code is not recommended due to implementation difficulties and costs. However, the Dun's+4 number is a national code used by PIDX for EDI communications and is under consideration by FERC for transportation reference by electronic bulletin boards (EBB's). There are differences of opinion as to the viability of Dun's numbers for tax identification purposes.
- Although the Business Associate code would be assigned by the state, a "translator table" would provide the capability of tracking business entity information across states. For example, the EIA currently maintains an Operator Frame which captures a federal operator number as well as the operator numbers assigned by individual states.
- If a state standard is used across state agencies, one agency should be designated to assign and maintain the Business Associate codes.
- Business Associate roles can be assigned and maintained by individual state agencies.

R-4 Well bores are linked to operators on an effective-dated basis and the links are stored in a common database.

Type of Guideline - Reference and Relationship

Purpose and Benefits

The purpose of this guideline is to enable the Conservation agency to maintain operating histories for all wells. This will facilitate the process of identifying responsibility for the well and production-related data.

Coding Options

- API Well Bore Number
- Business Associate code

Implementation Options

- All new wells
- Currently producing wells
- All wells in the state

Discussion Points

- Effective dates are starting and ending dates for a relationship between entities. These effective dates allow for and reflect changes in the relationship between well bores and operators over time.
- Strong support for this guideline has been expressed by some of the industry reviewers of the UPRM.

R-5 Well completions are linked to state leases on an effective-dated basis and the links are stored in a common database.

Type of Guideline - Reference and Relationship

Purpose and Benefits

The purpose of this guideline is to enable a Royalty agency to compare information reported to them at a state lease level with information reported to the Conservation agency at the well completion level. This will facilitate the process of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- A state also might want to extend this linkage to other public or private leases.

Discussion Points

- Effective dates are starting and ending dates for a relationship between entities. These effective dates allow for and reflect changes in the relationship between well completions and leasing arrangements over time.
- Historical linkages should be maintained for audit purposes.
- This guideline makes no assumptions about reporting levels and requirements, but simply specifies internal system linkages.

R-6 Well completions are linked to tax groups on an effective-dated basis and the links are stored in a common database.

Type of Guideline - Reference and Relationship

Purpose and Benefits

The purpose of this guideline is to enable a Tax agency to compare information reported to them at a tax group level with information reported to the Conservation agency at the well completion level. This will facilitate the process of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Effective dates are starting and ending dates for a relationship between entities. These effective dates allow for and reflect changes in the relationship between well completions and tax groups over time.
- Historical linkages should be maintained for audit purposes.
- This guideline makes no assumptions about reporting levels and requirements, but simply specifies internal system linkages.

R-7 Well completions are linked to their appropriate production allowables.

Type of Guideline - Reference and Relationship

Purpose and Benefits

The purpose of this guideline is to enable a state to maintain allowables information for well completions. Other agencies or data users can use this information to reconcile well test data and historical production with anticipated volumes.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- The term *Allowables* refers to the amount of gas or oil that a well is permitted to produce under proration orders of a state regulatory agency.
- Allowables are defined at variable levels within each state, and the ability to track allowables is useful to Conservation agencies.
- It has been suggested that well completions be linked to fields or reservoirs. Although the capability to do field and reservoir level analyses would be extremely useful, the cost and effort to implement and maintain the linkages between well completions and their associated fields and/or reservoirs could be high.

R-8 Well completions are linked to units on an effective-dated basis and the links are stored in a common database.

Type of Guideline - Reference and Relationship

Purpose and Benefits

The purpose of this guideline is to enable a state to link well completion information to unit level information for conservation purposes.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- A unit is defined by state statute or regulation, and can include enhanced recovery units and production spacing units.
- This guideline makes no assumptions about reporting levels and requirements, but simply specifies internal system linkages.
- Effective dates are starting and ending dates for a relationship between entities. These effective dates allow for and reflect changes in the relationship between well completions and units over time.

R-9 Transaction points are identified using a standard numbering system.

Type of Guideline - Reference and Relationship

Purpose and Benefits

Transaction points are the identified physical points used by state agencies for reporting purposes. These points are facilities such as wellhead meters, tank batteries, gas processing plants, etc. The purpose of this guideline is to provide a unique identification for the many points at which volumes are measured or calculated and values are determined and reported to state agencies. This guideline also will enable a state to track information about individual transaction points. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- PI GRID Code
- State Transaction Point Number
- MMS Offshore Transaction Point Number

Implementation Options

- All transaction points
- Major transaction points

Discussion Points

- The use of a national standard such as PI GRID Codes could provide the capability of tracking production information across states. This also would provide an interface to the transportation system and pipeline capacity information.
- The format of PI GRID Codes is:
 - 2 digit state code
 - 3 digit county code
 - 5 digit unique number
 - 2 digit facility number (identifying facility types such as tank batteries, gas processing plants, etc.)
 - (See Appendix F)
- State Transaction Point Numbers could be converted to PI GRID Codes using a "translator table".

R-10 Well completions are linked to transaction points on an effective-dated basis and the links are stored in a common database.

Type of Guideline - Reference and Relationship

Purpose and Benefits

This guideline will enable a state to track volumes from a specific well completion that were measured at individual transaction points. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- The ability to track volumes through the state (from one transaction point to another) would provide state agencies with better information on the flow of production through and out of the state. However, this capability is not necessarily provided by this guideline.
- Effective dates are starting and ending dates for a relationship between entities. These effective dates allow for and reflect changes in the relationship between well completions and transaction points over time.
- This guideline makes no assumptions about reporting levels and requirements, but simply specifies internal system linkages.
- This guideline permits production reporting systems to be interfaced to transportation data systems.

R-11 A standard location X-Y-Z coordinate system (e.g. latitude/longitude/elevation) is used to identify the location of each well or transaction point.

Type of Guideline - Reference and Relationship

Purpose and Benefits

This guideline would provide standard site location identification for each well or transaction point within the state. This guideline also would provide the capability for a state to utilize geographic information systems (GIS) to analyze and manage their data. GIS technology would facilitate tracking volumes through the state (from one transaction point to another), and would provide state agencies with better information on the flow of production through and out of the state. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- Latitude/Longitude
- State Plane Coordinates
- Universal Transverse Mercator (UTM)
- Elevation corrected to ground level

Implementation Options

- Site location information for new wells and transaction points
- Site location information for historical wells and transaction points
- Use of Global Positioning System (GPS) units or georeferenced satellite images for obtaining latitude and longitude for wells and transaction points.

Discussion Points

- Precise site location data provides a backup system for reconciling data anomalies.
- Spatial Data Transfer Standards identified in FIPS 173 should be followed.
- Legal descriptions vary from state to state, and site locations which are recorded using legal descriptions cannot be used in geographic information systems unless they are converted to some X-Y coordinate system.

TC-1 Well test information is provided at the well completion level for all tested hydrocarbons and is stored in a common database.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to provide Conservation agencies with well test data at appropriate levels. These data can then be used to calculate allowables or to monitor expected production. Other agencies or users also can utilize the well test data to anticipate volumes or values and to assist in setting leasing fees.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Well testing schedules and formats are defined at the discretion of the state. When well tests are performed, the data are provided at the well completion level for all tested hydrocarbons and entered into a common well test database.
- A state may elect to capture information on additional products such as carbon dioxide or water, but these are not core functions.

TC-2 Production volumes are reported for each separately measured well completion with the transaction point identified.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to provide volume data at the lowest common level in support of cross-verification. This will ultimately benefit data users with the most accurate and precise data in the most flexible manner for data analysis.

Coding Options

- None identified

Implementation Options

- For all well completions
- For gas wells only

Discussion Points

- The definition of a well completion within a well bore is determined by an individual state. For example, states may define commingled production as one completion.
- While reporting measured production volumes at the well completion level is recommended, it is recognized that such will not be practical for all wells in many states. In such circumstances, the reporting of allocated volumes at the well completion level is acceptable to the extent allowable by state statute or regulation. Each state should define the criteria for reporting allocated volumes.
- Quality measurements of production, such as heat (Btu) content of gas and API gravity of oil, should be reported as integral components of volume data. Quality measurement information is needed to correlate volumes to values. Additionally, heat content of gas is required to correlate volumes produced to volumes transported or consumed, which are reported in measurement units based on heat value.
- "Days-on/ days-off" information should be reported as an integral component of production-related data. This information is necessary in order to calculate Mcf per day of gas or Bbls per day of oil.

TC-3 Tax volumes and values are reported at the tax group level with the transaction point identified.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose for this guideline is to provide volumes and values at the appropriate level for Tax agency purposes. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Value basis is determined by each state agency by policy or statute.
- Marketable, net, gross, transaction value, etc. should be identified by statute or policy.
- Quality measurements of production, such as heat (Btu) content of gas and API gravity of oil, should be reported as integral components of volume data. Quality measurement information is needed to correlate volumes to values. Additionally, heat content of gas is required to correlate volumes produced to volumes transported or consumed, which are reported in measurement units based on heat value.
- If the quality measurements of production for gas or oil reported to the Tax agency are significantly different than those reported to the Conservation agency, the reason for the differences should be indicated.

TC-4 Royalty volumes and values are reported at the state lease level with tax group and transaction point identified.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to provide volumes and values at the appropriate level for Royalty agency purposes. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- The identification of tax group for Royalty volumes and values provides an additional link to information received by the Tax agency.
- Value basis is determined by each state agency by policy or statute.
- Marketable, net, gross, transaction value, etc. should be identified by statute or policy.
- Quality measurements of production, such as heat (Btu) content of gas and API gravity of oil, should be reported as integral components of volume data. Quality measurement information is needed to correlate volumes to values. Additionally, heat content of gas is required to correlate volumes produced to volumes transported or consumed, which are reported in measurement units based on heat value.
- If the quality measurements of production for gas or oil reported to the Royalty agency are significantly different than those reported to the Conservation agency, the reason for the differences should be indicated.

***TC-5 Production, Tax and Royalty volume information is
reported for all commercial hydrocarbons.***

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to ensure that all volume information for commercial hydrocarbons is accounted for within a state. This would provide a complete picture of a state's production and facilitate processes of data verification and audit. Better quality data would ultimately result.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- To the extent state law allows estimation of a product without actual measurement, that volume information is acceptable.
- The definition of commercial hydrocarbon is determined by state statute or policy.
- Although water production data are not explicitly included in this guideline, some industry reviewers of the UPRM strongly encouraged the addition of water production data to state reporting requirements.
- API/PIDX is defining standard units of measure for commercial hydrocarbons in the Petroleum Industry Data Dictionary (PIDD).

TC-6 Tax and Royalty value information is reported for all commercial hydrocarbon products severed or sold.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to ensure that a state will receive value information for all commercial hydrocarbon products that have been severed or sold. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Value basis is determined by each state agency by policy or statute.
- Marketable, net, gross, transaction value, etc. should be identified by statute or policy.
- The definition of commercial hydrocarbon is determined by state statute or policy.

TC-7 Conservation volume information is received as soon as possible, but no later than the last day of the month following the month of production.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to ensure that Conservation agencies will receive volume information in a timely manner. The volume information received by a Conservation agency is the basis for cross-agency verification and provides for timely data sharing.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Industry reviewers of the UPRM have indicated that 95% of the time this deadline will be appropriate. However, the timing may be a problem approximately 5% of the time due to delayed receipt of metered volume information.
- Industry reviewers of the UPRM have indicated that a deadline of 35 to 40 days after the last day of the month of production would be preferable in order to avoid operational conflicts with "closing week".

TC-8 Tax and Royalty volume and value information is received as soon as possible, but no later than the last day of the second month following the month of production.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to ensure that a state will receive Tax and Royalty volume and value information in a timely manner. This timing also may provide for a reduced number of adjustments and estimated volumes and values, which would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- The timing for remittance of payments is a matter of state policy, statute or contract.
- Individual state agencies should determine the appropriate timing window based on their specific circumstances.

TC-9 Information can be received and processed at any time prior to the due-date.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to enable a state to process data as received, reducing peak-day workloads. The adoption of this guideline also allows for the identification and correction of data discrepancies before the due-date, and would increase timeliness and accuracy of the data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Data can be processed as received rather than on a fixed monthly basis.
- This guideline provides the flexibility to accommodate near real-time reporting if such reporting becomes feasible.

TC-10 Incentives and other programs are used to encourage timely and accurate reporting of information.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to encourage timely and accurate reporting of data to state agencies. Adoption of this guideline could result in the reduction of errors, reporting-error costs and the level of adjustments, ultimately providing better quality data.

Coding Options

- None identified

Implementation Options

- Bond reductions
- Tax incentives
- Training programs
- Provide reporting software with built-in edit checks

Discussion Points

- Incentives such as bond reductions or tax incentives could be used to encourage the increased timeliness of data reporting.
- Timely and accurate reporting is defined by statute or established agency benchmarks.
- Some agencies have already developed PC-based software for distribution to Business Associates for reporting purposes. These software packages have capabilities ranging from simple edit checks to historical variance checks or EDI translation capabilities. For example, New Mexico is developing EDI translation software for reporters and EIA has developed reporting software that contains edit checks for form EIA-176.

TC-11 All volume dispositions are accounted for from the Production transaction point to the Tax or Royalty transaction point.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to ensure that a state receives complete information in order to support cross-agency verification, audits and the review of tax exemption claims and royalty allowances.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Volume disposition includes things such as line loss, flare, lease use, volumes sold, etc.
- In order to assist states in their natural gas reporting requirements to the Energy Information Administration (EIA), the following definitions are used per Form EIA-627:

Gross Withdrawals - Full well stream volume including all natural gas plant liquids and non hydrocarbon gases, but excluding lease condensate. Also includes amounts delivered as royalty payments or consumed in field operations.

Natural Gas - A mixture of hydrocarbon compounds and small quantities of various non hydrocarbons existing in the gaseous phase or solution with oil in natural underground reservoirs at reservoir conditions.

Natural Gas Plant Liquids - Natural gas liquids recovered from natural gas in processing plants and, in some situations from natural gas field facilities, as well as those extracted by fractionators. Natural gas plant liquids are defined according to the published specifications of the Gas Processors Association and the American Society for Testing and Materials as follows: ethane, propane, normal butane, isobutane, pentanes plus, and other products from natural gas processing plants (i.e. products meeting the standards for finished petroleum products produced at natural gas processing plants, such as finished motor gasoline, finished aviation gasoline, special naphthas, kerosene, distillate fuel oil, and miscellaneous products).

***TC-11 All volume dispositions are accounted for from the
Production transaction point to the Tax or Royalty
transaction point.***

Discussion Points (continued)

Casinghead Gas (or Oil Well Gas) - Natural gas produced along with crude oil from oil wells. It contains either dissolved or associated gas or both.

Non Hydrocarbon Gases - Total non hydrocarbon gases which may be present in reservoir natural gas such as carbon dioxide, helium, hydrogen sulfide, and nitrogen.

Lease Fuel - Natural Gas used in well, field, and lease operations, such as gas used in drilling operations, heaters, dehydrators, and field compressors.

Marketed Production - Gross withdrawals less gas used for repressuring, quantities vented and flared, and non hydrocarbon gases removed in treating or processing operations. Includes all quantities of gas used in processing plant operations. Excludes all gas used as lease fuel.

TC-12 Routine reporting requirements will include a provision for volume information to be reported by at least two parties with separate interests.

Type of Guideline - Timing and Content

Purpose and Benefits

The purpose of this guideline is to provide the capability to cross-check volume information provided by different business entities. Adoption of this guideline would assist state agencies in identifying potential data problems or errors in data reporting, and ultimately improve data quality.

Coding Options

- None identified

Implementation Options

- Volume data could be collected from two or more parties by the same state agency, or from two or more parties by different state agencies.
- Exceptions could be granted at the discretion of the state agencies.

Discussion Points

- This may not always be possible. The operator and first purchaser may be the same entity, or the first purchaser and the transporter may be the same entity.

C-1 Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.

Type of Guideline - Communication

Purpose and Benefits

The purpose of this guideline is to increase data consistency, accuracy and timeliness. In addition, state and industry costs would be lowered and errors minimized through the decreased manual handling of data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- ASC X12 is the Accredited Standards Committee X12, Electronic Data Interchange, chartered by the American National Standards Institute (ANSI) for the development of uniform standards for the electronic interchange of business transactions. ASC X12 is commonly referred to as ANSI X12. (See Appendix E)
- The REGS User Group, consisting of state and federal regulatory and industry representatives, is developing conventions for ASC X12 transaction sets.

C-2 *Information can be received by a state via magnetic media.*

Type of Guideline - Communication

Purpose and Benefits

The purpose of this guideline is to increase data timeliness and accuracy. In addition, state and industry costs would be lowered and errors minimized through the decreased manual handling of data.

Coding Options

- EDI conventions, where developed
- State determined standards where developed

Implementation Options

- None identified

Discussion Points

- The use of magnetic media using currently developed state reporting standards will provide compatibility with current industry reporting.
- Magnetic tapes and diskettes are included within this guideline.
- This guideline does not preclude receiving information on paper.

C-3 Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.

Type of Guideline - Communication

Purpose and Benefits

The purpose of this guideline is to increase data consistency and accessibility between agencies, states, and end users. The ability to return error transactions for correction would increase the timeliness of the data. State and industry costs would be lowered through the decreased manual handling of data.

Coding Options

- None identified

Implementation Options

- Transmission of Acknowledgments
- Data errors
- On-request data

Discussion Points

- The use of EDI to return invalid data to the reporting entity would increase the timeliness of corrections and lower both industry and state costs for manual data handling.
- ASC X12 is the Accredited Standards Committee X12, Electronic Data Interchange, chartered by the American National Standards Institute (ANSI) for the development of uniform standards for the electronic interchange of business transactions. ASC X12 is commonly referred to as ANSI X12. (See Appendix E)
- The REGS User Group, consisting of state and federal regulatory and industry representatives, is developing conventions for ASC X12 transaction sets.

C-4 Information can be transmitted from state agencies via magnetic media.

Type of Guideline - Communication

Purpose and Benefits

The purpose of this guideline is to increase data timeliness. In addition, state and industry costs would be lowered through the decreased manual handling of data.

Coding Options

- Standard EDI conventions, where developed
- State developed standards where developed

Implementation Options

- None identified

Discussion Points

- The use of magnetic media using currently developed state reporting standards will provide compatibility with current industry reporting.
- Information can be transmitted to data users, state agencies and industry.
- Allows for two-way communication with industry members that do not utilize EDI.
- The use of EDI to return invalid data to the reporting entity would increase the timeliness of corrections and lower both industry and state costs for manual data handling.
- Magnetic tapes and diskettes are included within this guideline.
- This guideline does not preclude transmitting information on paper.

***C-5 The use of electronic forms of communication is supported
by a state.***

Type of Guideline - Communication

Purpose and Benefits

The purpose of this guideline is to facilitate communications between state agencies and industry. The adoption of the guideline provides for a method to increase the accessibility of agency personnel to each other and to industry. This increased accessibility would allow for more timely responses to specific questions regarding data discrepancies and reporting problems, ultimately increasing the timeliness and accuracy of the data.

Coding Options

- None identified

Implementation Options

- Voice mail
- Agency contact lists
- Electronic mail for communication between agencies
- Electronic mail for communication with industry

Discussion Points

- Reporting requirements could be routinely made available in both electronic and published forms.

V-1 Each agency will internally validate and verify data to meet minimum data quality standards. Error statements will be returned to the reporters of the data.

Type of Guideline - Validation and Verification

Purpose and Benefits

The purpose of this guideline is to ensure that the data are validated to meet minimum data quality standards before the data can be released to data users.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Validation processes include initial quality checks such as:
 - production reported only for valid well completions, tax groups or state leases;
 - volumes and values sum properly; etc.Data that fail validation processes are not accepted.
- Verification processes include quality checks such as:
 - all expected production is reported;
 - no net negative production volumes;
 - variance ranges are used for data checked against historical information; etc.Data that fail verification processes are marked for further analysis. (See Uniformity Guideline S-27)
- Invalid data can be returned to reporters using EDI, magnetic media or paper. (See Communication Uniformity Guidelines)
- Validation and verification processes also will apply to adjustments.

V-2 Conservation, Tax and Royalty agencies will cross-verify volume data.

Type of Guideline - Validation and Verification

Purpose and Benefits

The purpose of this guideline is to provide data verification for volume data across agencies. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Royalty agencies receive information related to state lands.
- Since the basis for volume reporting can be different (e.g., severed and sold versus entitlement basis), this verification process might have to include a range of acceptable variances.
- Cross-verification processes are quality checks such as:
 - variance ranges used for checking aggregated volume data reported to the Conservation agency against volume data reported to the Tax agency at the tax group level or to the Royalty agency at the state lease level; etc.Data that fail cross-verification processes are handled according to procedures defined using Uniformity Guideline V-4.

V-3 *Tax and Royalty agencies will cross-verify value data.*

Type of Guideline - Validation and Verification

Purpose and Benefits

The purpose of this guideline is to provide data verification for value data across agencies. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Royalty agencies receive information related to state lands.
- Values reported to the Tax and Royalty agencies may be calculated based on different statutes and policies. For example, exemptions, allowances, compression differences and gross value may be calculated differently. The verification process may need to include a range of acceptable variances to accommodate these differences.
- Cross-verification processes are quality checks such as:
 - variance ranges used for checking value information reported to the Tax agency and Royalty agency; etc.Data that fail cross-verification processes are handled according to procedures defined using Uniformity Guideline V-4.

V-4 States will develop cross-agency verification procedures for handling exceptions and for resolving data discrepancies between agencies.

Type of Guideline - Validation and Verification

Purpose and Benefits

The purpose of this guideline is to call for an agreement between state agencies that outlines the procedures for processing data discrepancies. This will assure that exception processing is comprehensive but not redundant. Such an agreement for verification procedures is necessary to ensure data quality.

Coding Options

- None identified

Implementation Options

- State protocol
- Memorandum of Understanding between state agencies

Discussion Points

- Individual states must define procedures for processing exception data that are appropriate to their agencies.

V-5 *Cross-agency data verification will begin no later than six months after the month of production.*

Type of Guideline - Validation and Verification

Purpose and Benefits

The purpose of this guideline is to set a time frame for agency cross-verification that allows time for state agencies to process adjustments and complete internal validation and verification processes. Adoption of this guideline would facilitate the processes of data verification and audit, and would ultimately result in better quality data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- The cross-agency data verification cannot begin until individual state agencies have completed their internal validation and verification processes, allowing ample time for adjustments to be reported. The optimal time frame for this process will vary by state.
- Within six months after production, most of the data will have been validated and internally verified by the individual state agencies, and the vast majority of adjustments will have been processed.

Volume data provided includes:

S-1 Well Tests

S-2 Allowables

S-3 Production Volumes

S-4 Tax Volumes

S-5 Royalty Volumes

Type of Guideline - Data Sharing

Purpose and Benefits

The purpose of these guidelines is to provide for increased accessibility to volume data.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- The timing for release of certain non-volume data has an impact on exploration industry competition, and may need to be considered by states.
- Individual states may define appropriate charges or fees in order to recover their costs for providing data to users.
- Quality measurements of production, such as heat (Btu) content of gas and API gravity of oil, should be available as integral components of volume data. Quality measurement information is needed to correlate volumes to values. Additionally, heat content of gas is required to correlate volumes produced to volumes transported or consumed, which are reported in measurement units based on heat value.
- If the quality measurements of production for gas or oil reported to the Tax agency are significantly different than those reported to the Conservation agency, the reason for the differences should be indicated.

Volume data provided includes:

S-1 Well Tests

S-2 Allowables

S-3 Production Volumes

S-4 Tax Volumes

S-5 Royalty Volumes

Discussion Points (continued)

- Although water production data are not explicitly included in this guideline, some industry reviewers of the UPRM strongly encouraged the addition of water production data to state reporting requirements. Data users should be provided with water production data if collected.
- "Days-on/days-off" information should be available as an integral component of production-related data. This information is necessary in order to calculate Mcf per day of gas or Bbls per day of oil.

Value data provided includes:

S-6 Tax Values and Value Basis

S-7 Royalty Values and Value Basis

Type of Guideline - Data Sharing

Purpose and Benefits

The purpose of these guidelines is to provide for increased accessibility to value data.

Coding Options

- None identified

Implementation Options

- All data are available to data users
- If restricted by state confidentiality statutes:
 - some data are available to all users
 - reporting entities have access only to their reported data

Discussion Points

- Individual states may be limited in the release of value data by confidentiality statutes. In addition, the timing for release of certain non-volume data has an impact on exploration industry competition, and may need to be considered by states.
- Individual states may define appropriate charges or fees in order to recover their costs for providing data to users.
- Values reported to the Tax and Royalty agencies may be calculated based on different statutes and policies. For example, exemptions, allowances, compression differences and gross value may be calculated differently.

Reference data provided includes:

S-8 Well Completion

S-9 Well Bore

S-10 Unit

S-11 State Lease

S-12 Business Associate

S-13 Tax Group

Type of Guideline - Data Sharing

Purpose and Benefits

The purpose of these guidelines is to provide for increased accessibility to reference data. Adoption of this guideline will facilitate the analysis of data from different entities.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Individual states may define appropriate charges or fees in order to recover their costs for providing data to users.

Relationship data provided includes:

S-14 Well Completion to Well Bore Link

S-15 Well Completion to Unit Link

S-16 Well Completion to Tax Group Link

S-17 Well Completion to State Lease Link

S-18 Well Completion to Transaction Point Link

Type of Guideline - Data Sharing

Purpose and Benefits

The purpose of these guidelines is to provide for increased accessibility to relationship data. This capability will allow data users to utilize the data from different entities for analysis.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Individual states may define appropriate charges or fees in order to recover their costs for providing data to users.

Information is provided to the data user via:

S-19 Electronic Data Interchange (EDI)

S-20 Magnetic Media

S-21 On-line Inquiry

S-22 Paper Reports

S-23 CD-ROM

Type of Guideline - Data Sharing

Purpose and Benefits

The purpose of these guidelines is to provide data users with increased accessibility using a variety of media.

Coding Options

- None identified

Implementation Options

- On-line access on-site or from remote locations

Discussion Points

- CD-ROM may be used for large volumes of data or for historical or static data.
- Individual states may define appropriate charges or fees in order to recover their costs for providing data to users.
- These guidelines do not imply that a state must respond to all varieties of ad-hoc reporting or non-standard formatting requests.

S-24 Validated data should be released in a timely manner no later than one month after they are received by the agency.

Type of Guideline - Data Sharing

Purpose and Benefits

The purpose of this guideline is to provide validated information to the users of the data as quickly as possible, while allowing agencies time to process the incoming data and perform preliminary data validations. This will provide for increased timeliness for data sharing.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Preliminary validations are complete before data are released.
- Validated data are defined as data that have met minimum quality standards. (See Uniformity Guideline V-1)
- Possible discrepancies are identified with the release of the data. (See Uniformity Guideline S-27)
- Statistics identifying expected completeness of the data are released with the data. (See Uniformity Guideline S-26)

S-25 Data will be provided to data users in standard output formats.

Type of Guideline - Data Sharing

Purpose and Benefits

The purpose of this guideline is to provide data in standard output formats to the users of the data. The adoption of this guideline would provide data users with more accessible and consistent data across states for use in their analysis.

Coding Options

- None identified

Implementation Options

- Aggregation levels for reports in standard output formats could include state-wide totals as well as information by county, field or pool.
- Detail level data for reports in standard output formats.

Discussion Points

- Development of standard report formats is outside of the scope of the initial development of the UPRM project. However, standard report output formats should be defined prior to state implementation of the UPRM.
- Since this Uniformity Guideline should be incorporated in a production reporting system's design, the goal and result would be a reduction in the use of personnel resources and increased consistency for data users.

S-26 Statistics will be provided to data users as a measure of data completeness.

Type of Guideline - Data Sharing

Purpose and Benefits

This guideline will provide statistical information in a standard format to the users of the data. Information will include measurements of completeness of the data such as:

- number of transactions received compared to expected number of transactions
- total volumes reported compared to prior months' volumes
- number of data problems identified

These measurements will provide data users with information that will make analyses of the data more meaningful.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- The development of specific criteria and formats for these statistics is outside of the scope of this project. These criteria and formats need to be part of the standard output formats developed for Uniformity Guideline S-25.
- An upgraded production reporting system should mechanically generate and maintain statistics without requiring personnel resources.
- Prior months used for comparison may include the previous several months or the previous year's comparable month.

S-27 In-process data discrepancies are identified for data users.

Type of Guideline - Data Sharing

Purpose and Benefits

The purpose of this guideline is to ensure that data discrepancies that have been identified and are in-process by the state agencies are flagged for the data user in a standard format. This information will provide end users with information that will make analyses of the data more meaningful.

Coding Options

- None identified

Implementation Options

- None identified

Discussion Points

- Data discrepancies should be flagged both at a detail level and at aggregate levels.
- Data discrepancy flags will be cleared upon correction.
- Since the basis for volume and value reporting can be different (e.g., severed and sold versus entitlement basis), this verification process might have to include a range of acceptable variances.
- The development of formats for the flagging of discrepancies for data users is outside of the scope of this project. These formats should be part of the standard output formats developed for Uniformity Guideline S-25.
- An upgraded production reporting system should mechanically generate and maintain discrepancy flags without requiring personnel resources.

Appendix A

Section 3

System Functions

Introduction

SYSTEM FUNCTIONS

Introduction

This section provides a broad overview of the system functions and features normally required to support state agencies involved in the oversight of the petroleum industry. While the individual functions may vary somewhat from state to state, this framework provides a general approach for capturing the major functionality. The section is sub-divided into two components: The Overview Diagrams and the Function Descriptions.

Overview Diagrams

Component Definition Diagram

This document outlines the major *components* of a typical information system and helps to identify those portions that are the focus of the Conceptual Model. Important components include:

- Hardware
- Technical Architecture
- Application Software
 - Shared Functions
 - Agency-Specific Functions

Since the Conceptual Model makes no assumptions about hardware, technical architecture or specific application software, the focus is on Shared Functions and Agency-Specific Functions.

Function Definition Diagram

This diagram is a further refinement of the Component Definition Diagram and introduces the individual system *functions*. These functions are classified as either unique agency-specific functions or shared functions.

Function Descriptions

The Function Description documents provide more detail into the specifics of the type of processing handled by each function. Each function description includes sub-functions, inputs and outputs.

Functions are defined as either *core* or *non-core*. *Core* functions are those that are directly related to the processing of production-related information. *Non-core* functions are those that are *not* directly related to the processing of production-related information. Descriptions for *core* functions contain more detailed information than descriptions for *non-core* functions, reflecting the relative importance of the functions to the processing of production-related information.

Appendix A

Section 3

System Functions

Overview Diagrams

Component Definition Diagram

Description:

The Component Definition Diagram illustrates the technical layers that comprise a system. Each layer represents a major component of the system:

-Hardware:

the foundation of the system made up of the physical hardware components used to run the system

-Technical Architecture:

the layer of components that enables the application software to run on the hardware platform and includes the operating system, system software, protocols, utilities, database management systems, etc. used to control system processing

-Application Software:

the software programs that provide the functionality needed to meet the business processing requirements

Purpose:

The Component Definition Diagram highlights the **Application Software** by shading this layer. The *Application Software* has been divided into Shared Functions and Agency Specific Functions. This separation demonstrates that some functions are used by all of the agencies but each agency also has functions that remain unique to that agency.

Function Definition Diagram

Function Definition Diagram

Document Description

Description:

The Function Definition Diagram represents the **Application Software** layer of the Component Definition Diagram. The business functions that are unique to a particular state agency are listed under the appropriate agency. The business functions that are shared among the agencies are listed under **Shared Functions**. The functions and a brief description follow.

Conservation Functions:

Permitting:	Review and approve or reject permit applications
Well Test:	Verify and maintain well test information
Allowables:	Determine, maintain and monitor allowables
Unitization:	Maintain unit information

Tax Functions:

Tax Group Management:	Maintain tax group information
Tax Accounting:	Ensure accurate payment and allocation of taxes

Royalty Functions:

State Lease Management:	Maintain lease information for state-owned lands
Royalty Accounting:	Ensure accurate payment and allocation of royalties on state-owned lands

Shared Functions:

Data Capture/Validation:	Capture, edit, validate and track source information and forward transactions to other system functions
Registration/Relationship Maintenance:	Add and maintain reference information related to business entities and maintain their relationships
Remittance Processing:	Support the processing of reports, payments, adjustments, refunds and claims
Bonding:	Maintain appropriate levels of surety as required by statute
Fund Accounting:	Track, report and apportion taxes and royalty
On-line Inquiry/Reporting:	Provide on-line access to current and historical data and produce ad hoc and management reports
Correspondence Management:	Track business associate correspondence and maintain historical correspondence detail
Audit:	Maintain audit descriptions, report case status, and maintain case resolutions
Volume Analysis:	Facilitate cross-agency comparisons of volume data
Value Analysis:	Facilitate cross-agency comparisons of value data
External Data Sharing:	Provide gas and oil production-related data to data users through a variety of media

Function Definition Diagram

Core Functions vs. Non-Core Functions

Core Functions:

Those functions that are directly related to the capture, validation and sharing of production-related information.

Non-Core Functions:

The remaining functions performed by Conservation, Tax or Royalty agencies that are not directly related to the capture, validation and sharing of production-related information.

Appendix A

Section 3

System Functions

Function Descriptions

APPENDIX A

SECTION 3

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Allowables

Overview

The *Allowables* function will provide for the review of production history, well tests and conservation technical factors to define and maintain allowables. The allowables can be adjusted upon further review. Operator Allowables Schedules will be generated and sent to the operators. Production volumes are monitored to ensure that the set allowables are not exceeded, and the allowables net balances are maintained. When over-production or under-production persists, the operators will be notified.

Sub-functions

Automatically Calculate Allowables

Modify Allowables

Generate Operator Allowables Schedules

Monitor and Adjust Allowables Net Balances

Notification of Overage or Underage

Inputs and Outputs

Inputs

- Well Test Information
- Conservation Technical Factors
- Conservation Production Volumes

Outputs

- Allowables Definitions
- Operator Allowables Schedules
- Overage or Underage Reports

Data Capture & Validation

Overview

The *Data Capture and Validation* function will provide standardized mechanisms to capture, validate and track source information. Data can be accepted in an electronic format, which includes EDI, magnetic tape, floppy diskettes, etc., or in hard copy format, which will require manual entry of the data. All input data will be validated using edit checks to ensure proper formatting, data types, data completeness, footing, etc. This function will feed transaction information to other system functions as documented by the *Business Event Flows*.

Sub-functions

Data Capture

- Capture State Lease Agreement
- Capture Permit Applications
 - to drill
 - to perforate
 - to abandon
- Capture Completion Reports
- Capture Royalty or Tax Remitter Identification Forms
- Capture Unit Agreement
- Capture Well Test Data
- Capture Conservation Volumes
- Capture Tax Volumes and Values
- Capture Royalty Volumes and Values
- Capture Transaction Points

Validation

- Validate captured data for primary edit checks:
 - Data Type*
 - Formatting*
 - Data Completeness*
 - Footing, etc.*

Error Handling

- Notify Operators of Exceptions
- Notify Reporters or Remitters of Exceptions

Inputs and Outputs

Inputs

- State Lease Agreement
- Permits to Drill
- Permits to Perforate
- Permits to Abandon
- Completion Reports
- Royalty or Tax Remitter Identification Forms

Data Capture & Validation**Inputs (continued)**

- Unitization Agreement
- Well Test Detail
- Conservation Volumes Reports
- Tax Volumes and Values Reports
- Royalty Volumes and Values Reports
- Transaction Point Information

Outputs

- Update to State Lease
- Update to Permit Application
- Update to Unit
- Update to Well Test Data
- Update to Conservation Volumes
- Update to Tax Volumes and Values
- Update to Tax Payments
- Update to Royalty Volumes and Values
- Update to Royalty Payments
- Update to Transaction Points
- Exception Reports

External Data Sharing**Overview**

The *External Data Sharing* function will allow for the sharing of gas and oil production-related information with state and federal government agencies, private industry, the general public, etc. It is intended to provide data access through a variety of flexible media.

Sub-functions**Process Requests using variable media**

- *On-Line Access*
- *Reports*
- *Data Transfer*
 - Via Disk or Tape
 - Via EDI
 - Via CD-ROM

Inputs and Outputs**Inputs**

- Standard, centralized production-related information

Outputs

- Shared data

Permitting

Overview

The *Permitting* function will provide the functionality required for the review and approval or rejection of permit applications and completion reports.

Sub-functions

Permit Maintenance

- Evaluate Permit Application
- Approve or Reject Permit
- Update Permit Information with the status of permit
- Examples:
 - *Permit to drill*
 - *Permit to perforate*
 - *Completion report*
 - *Permit to abandon*

Notification

- Notify appropriate business associate of permit status

Inputs and Outputs

Inputs

- Permit Applications
 - to drill
 - to perforate
 - completion report
 - to abandon

Outputs

- Responses to Correspondence Management
 - *Approval notice*
 - *Rejection notice*
 - *API Well Bore Numbers*
 - *Completion notice*

Registration & Relationship Maintenance**Overview**

The *Registration and Relationship Maintenance* function will provide for the addition and maintenance of reference information related to business entities. This function will also provide for the maintenance of relationships between business entities. Example entities include well bores, well completions, state leases, tax groups, etc. Example relationships include well completion to state lease, well completion to tax group, well bore to operator, etc.

Sub-functions**Business Entity Maintenance**

- Maintain Business Associates
- Maintain State Leases
- Maintain Well Bore
- Maintain Well Completion
- Maintain Unit
- Maintain Tax Group
- Maintain Tax Exemptions
- Maintain Transaction Points

Relationship Maintenance

- Maintain Business Associate Relationships
- Maintain Royalty Lease Relationships
- Maintain Well Bore Relationships
- Maintain Well Completion Relationships
- Maintain Tax Group Relationships
- Maintain Unit Relationships
- Maintain Transaction Point Relationships

Inputs and Outputs**Inputs**

- New entity or relationship reference information
- Changes to existing entities or relationships

Outputs

- Update to reference databases

Unitization**Overview**

The *Unitization* function will provide for the processing and maintenance of unitization agreements. A notification of unitization, which includes the unit number, will be issued to the operator.

Sub-functions

Unit Maintenance

Notification of Unitization

Inputs and Outputs**Inputs**

- Unit Agreements

Outputs

- Update to Unit
- Notice of Unitization

Value Analysis**Overview**

The *Value Analysis* function will provide for comparisons of value information across Tax and Royalty agencies to ensure that accurate and consistent value information is being provided.

Sub-functions**Cross-Agency Value Comparison**

includes aggregation or breakdown of data to same level (e.g., well completion)

Notification of Exceptions**Inputs and Outputs****Inputs**

- Tax values
- Royalty values

Outputs

- Exceptions Transactions or Reports

Volume Analysis**Overview**

The *Volume Analysis* function will provide for comparison of volume information across Conservation, Tax and Royalty agencies to ensure that accurate and consistent volume information is being provided.

Sub-functions**Cross-Agency Volume Balancing**

includes aggregation or breakdown of data to same level (e.g., well completion)

Notification of Exceptions**Inputs and Outputs****Inputs**

- Conservation volumes
- Tax volumes
- Royalty volumes

Outputs

- Exceptions Transactions or Reports

Audit**Overview**

The *Audit* function will provide support to auditors through audit description maintenance, status reporting and resolution maintenance. It will also provide historical reference information for future audits.

Sub-functions

Audit Documentation

Audit Tracking

Audit Resolution

Bonding**Overview**

The *Bonding* function will provide for the maintenance of appropriate levels of surety as required by statute, policy or contract. A business associate may be required to be bonded when acting as a royalty lessee, royalty remitter, tax remitter, etc.

Sub-functions

Bond Maintenance

Correspondence Management**Overview**

The *Correspondence Management* function will provide for centralized correspondence control and processing. This function will track business associate correspondence and maintain historical correspondence detail. Correspondence Management will be integrated with other system functions to process and track correspondence requests from those functions. On-line applications will support tracking of user requests for special types of correspondence.

Sub-functions

Correspondence Maintenance and Review

Business Associate Correspondence Tracking

Historical Filing of Correspondence

Fund Accounting**Overview**

The *Fund Accounting* function will provide for the internal budgeting process of individual state agencies.

Sub-functions

Apportionment

Fund Adjustments

Fund Distribution

On-Line Inquiry & Reporting**Overview**

The *On-Line Inquiry and Reporting* function will provide enhanced data accessibility through on-line data access. On-line applications will allow users to view current and historical data from multiple views. Appropriate security requirements will be defined on a state-by-state basis, depending on each state's statutory requirements.

The Reporting sub-functions will provide a mechanism to produce ad hoc reports and management reports. The reports can be used for strategic management and operational decisions and can provide management with the information needed to measure success in achieving objectives. Management Reporting will include statistical, control and planning reports.

Sub-functions

On-Line Inquiry

Ad hoc Reporting

Management Reporting

Scheduled Reporting

Remittance Processing**Overview**

The *Remittance Processing* function will support the processing and reconciliation of forms, payments, adjustments, refunds and claims. This function includes the receipt of payment information, logging the payment information into the system and preparing deposit listings.

Sub-functions

Non-Filer Processing

Filing Fees

Penalty and Interest Assessments

Billings and Collections

Credit or Refund Identification

Claim Processing

Receipt / Log of Payments

Numeric Validation

Deposit Preparation

Royalty Accounting**Overview**

The *Royalty Accounting* function will ensure accurate allocation of royalties paid on state-owned lands.

Sub-functions

State Lease Management**Overview**

The *State Lease Management* function will support the bidding and leasing requirements for the Royalty agency. The bidding for the state lands will be initiated and handled by the Royalty agency.

Sub-functions

Bid Process

Maintain State Lease

Identify Well Completions on State Leases

Identify Units associated with State Leases

Identify Royalty Remitters

Tax Accounting**Overview**

The *Tax Accounting* function will ensure accurate allocation of tax payments to the appropriate entities.

Sub-functions**Tax Group Management****Overview**

The *Tax Group Management* function will support the definition and maintenance of tax groups and their associated tax exemptions for the Tax agency.

Sub-functions

Tax Group Maintenance

Identify New Well Completions

Issue Clearance to Remove Product

Identify Tax Remitters

Well Test

Overview

The *Well Test* function allows for the verification, review and maintenance of well test information.

Sub-functions

Well Test Verification

Well Test Maintenance

Appendix A

Section 4

Conceptual Data Stores

Introduction

CONCEPTUAL DATA STORES

Introduction

Data stores are simply general repositories of similar information. While they might reflect distinct databases or tables in a final system design, they are not necessarily designed for that purpose. The Conceptual Data Stores are defined at a high level and are intended to provide an example of the type of data that might be contained in each data store. The following section describes the conceptual data stores that have been defined in support of the Conceptual Model and provides a high-level description of the types of databases that will be necessary to support the system.

The conceptual data stores described in the following section are defined as either *core* or *non-core*. *Core* data stores are those that are directly related to the processing of production-related information. *Non-core* data stores are those that are *not* directly related to the processing of production-related information. Descriptions for *core* data stores contain more detailed information than descriptions for *non-core* data stores, reflecting the relative importance of the data stores to the processing of production-related information.

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Section 4

Conceptual Data Stores

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CORE

ALLOWABLES

Field Name	Comments
Well Completion Code	
Product	Gas, Oil, etc.
Allowable Limit	Limit within the producing time interval
Allowables Balance	Accounts for production relative to allowable limit
Effective Date	
End Date	

BUSINESS ASSOCIATE (BA)

Field Name	Comments
Business Associate Number	Standard business associate number
Business Associate Name	Name of the associate
Business Associate Role	Operator, Transporter, First Purchaser, etc.
Contact	Name of person to contact
Address	
Phone Number	

LESSEE-TO- LEASE LINK

Field Name	Comments
Lessee Business Associate Number	
State Lease Number	
Effective Date	
End Date	

PERMIT APPLICATION

Field Name	Comments
Permit Number	
Permit Type	
Applicant	
Date Entered	
Approve/Reject Status	
Status Date	
Well Bore Number	API Well Bore Number
Exception Information	

RAW PRODUCTION VOLUMES

Field Name	Comments
Well Completion Code	
Production Beginning Date	Beginning of production period
Production Ending Date	End of production period
Production Volumes	Commercial hydrocarbons
Reporter Business	
Associate Number	

RAW ROYALTY VOLUMES AND VALUES

Field Name	Comments
State Lease Number	
Production Beginning Date	Beginning of production period
Production Ending Date	End of production period
Production Volumes	Commercial hydrocarbons
Sales Volumes	Commercial hydrocarbons
Sales Values - Gross	Commercial hydrocarbons
Sales Values - Net	Commercial hydrocarbons
Royalty Amount	Commercial hydrocarbons
Exemptions	Specifies exemptions claimed
Reporter Business	
Associate Number	

RAW TAX VOLUMES AND VALUES

Field Name	Comments
Tax Group Number	
Production Beginning Date	Beginning of production period
Production Ending Date	End of production period
Production Volumes	Commercial hydrocarbons
Sales Volumes	Commercial hydrocarbons
Sales Values - Gross	Commercial hydrocarbons
Sales Values - Net	Commercial hydrocarbons
Tax Amount	
Remitter Business	
Associate Number	

RAW WELL TEST

Field Name	Comments
Well Completion Code	
Test Type	
Test Dates	
Test Volumes	All tested hydrocarbons

ROYALTY PAYMENT

Field Name	Comments
State Lease Number	
Production Beginning Date	Beginning of production period
Production Ending Date	End of production period
Royalty Amount	
Remitter Business	
Associate Number	

STATE LEASE

Field Name	Comments
State Lease Number	
Lease Name	
Lessor	
Lessee	
Lease Location	
Effective Date	
End Date	

TAX EXEMPTIONS

Field Name	Comments
Tax Group Number	
Exemption Type	
Effective Date	
End Date	

TAX GROUP

Field Name	Comments
Tax Group Number	
Tax Group Name	
Effective Date	
End Date	

TAX PAYMENT

Field Name	Comments
Tax Group Number	
Production Beginning Date	Beginning of production period
Production Ending Date	End of production period
Tax Amount	
Remitter Business	
Associate Number	

TRANSACTION POINTS

Field Name	Comments
Transaction Point Number	
Facility Type	
Effective Date	
End Date	

UNIT

Field Name	Comments
Unit Number	
Unit Name	
Operator	
Effective Date	
End Date	

VALIDATED PRODUCTION VOLUMES

See Raw Production Volumes

VALIDATED ROYALTY PAYMENT

See Royalty Payment

VALIDATED ROYALTY VOLUMES AND VALUES

See Raw Royalty Volumes and Values

VALIDATED TAX PAYMENT

See Tax Payment

VALIDATED TAX VOLUMES AND VALUES

See Raw Tax Volumes and Values

VALIDATED WELL TEST

See Raw Well Test

WELL BORE

Field Name	Comments
Well Bore Number	API Well Bore Number
Well Bore Name	
Surface Location	
Operator Business	
Associate Number	
Effective Date	
End Date	

WELL BORE-TO- OPERATOR LINK

Field Name	Comments
Operator Business	
Associate Number	
Well Bore Number	API Well Bore Number
Effective Date	
End Date	

WELL COMPLETION

Field Name	Comments
Well Completion Code	
Well Completion Name	
Perforated Interval(s)	
Other Physical	
Characteristics	
Effective Date	
End Date	

WELL COMPLETION -TO- STATE LEASE LINK

Field Name	Comments
Well Completion Code	
State Lease Number	
Effective Date	
End Date	

WELL COMPLETION -TO- TAX GROUP LINK

Field Name	Comments
Well Completion Code	
Tax Group Number	
Effective Date	
End Date	

WELL COMPLETION -TO- TRANSACTION POINT LINK

Field Name	Comments
Well Completion Code	
Transaction Point Number	
Effective Date	
End Date	

WELL COMPLETION -TO- UNIT LINK

Field Name	Comments
Well Completion Code	
Unit Number	
Effective Date	
End Date	

WELL COMPLETION -TO- WELL BORE LINK

Field Name	Comments
Well Completion Code	
Well Bore Number	API Well Bore Number
Effective Date	
End Date	

NON-CORE

BONDING

Contains relevant information to support recognizing bonded versus non-bonded business associates.

CONSERVATION TECHNICAL FACTORS

Contains conservation know-how and expertise such as geologic and engineering considerations and includes technical factors, such as depth, pressure, formation data, market demand, etc. Note that this is probably a collection of extremely complex databases.

SPACING

Contains the details of specific spacing requirements sufficient to support the approval or rejection of applications for permit.

Appendix A

Section 5

Entity-Relationship Data Model

Introduction

ENTITY RELATIONSHIP DATA MODEL

Introduction

This section describes the business entities that are involved in the petroleum industry and their relationships to each other. The Entity-Relationship Data Model provides a general approach for capturing information about the major business entities and their relationships, recognizing that specific terminology may vary somewhat from state to state.

Entity-Relationship Diagram

The Entity Relationship Diagram is a graphical representation of the business entities and their relationships to each other. Entities are represented as boxes in the diagram, and relationships are represented as lines or connections between the boxes. Lines indicate the existence of a relationship between two entities, but do not necessarily represent the flow of data between entities.

Entity Descriptions

The Entity Descriptions provide more detail about each specific business entity. These descriptions include aliases or alternate names for the entities and specific descriptions of the relationships that exist between each of the business entities.

Document Description

The Entity Relationship Diagram is a graphical representation of business entities and their relationships to each other. Entities are represented as boxes in the diagram, and relationships are represented as lines or connections between the boxes. Lines or connections indicate the existence of relationship between two entities, but **do not necessarily represent the flow of data between entities**. Relationships between entities can be one-to-one, one-to-many, or many-to-many.

Example:

Appendix A

Section 5

Entity-Relationship Data Model

Entity-Relationship Diagram

Entity-Relationship Diagram

Appendix A

Section 5

Entity-Relationship Data Model

Entity Descriptions

Appendix A

Section 5

Entity-Relationship Data Model

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Entity Name**Allowable****Description**

The amount of oil or gas that a well is permitted to produce under proration orders of a state regulatory agency. This amount is determined based on well test information production history for the well completion, and conservation technical factors such as depth, pressure, formation and market demand.

Aliases

Permitted Production Rate
Permitted Production Limit

Relationships**Entity****Relationship to Allowable**

Conservation Technical
Factors

Many : One. Many Conservation Technical Factors including market demand, depth, pressure and formation are reviewed in order to set or determine the Allowables for a Well Completion.

Production History

One : One. The Production History for a Well Completion is reviewed in order to set or determine the Allowable for a Well Completion.

Well Completion

One : One. Each Well Completion has one Allowable assigned for a given period of time.

Well Test

One : One. The latest Well Test is reviewed in conjunction with other factors in order to set or determine the Allowable for a Well Completion.

*Entity Name***Compression***Description*

The point at which oil or gas production volumes are lost or changed due to compression factors before production volumes are removed from the lease.

*Aliases**Relationships**Entity*

Lease Delivery System

Relationship to Compression

One : Many. Each Lease Delivery System may have many Compression points.

Entity Name

Conservation Technical Factors

Description

Conservation Technical Factors include depth, pressure, formation, market demand and other technical factors associated with the well, pool, or field. These factors are reviewed in order to assist in calculating the Allowables for Well Completions. Allowables also are based on well test information and production history for the well completion.

AliasesRelationshipsEntityRelationship to Conservation Technical
Factors

Allowable

One : Many. An Allowable for a Well Completion is based on many Conservation Technical Factors.

Entity Name**Custody Transfer Point**Description

The point at which the physical properties of the product are transferred from the operator to the Gatherer/Transporter or the Gas Processor.

Aliases

Point of Disposition
Transaction Point

RelationshipsEntityRelationship to Custody Transfer Point

Gas Processor

Many : Many. Each Gas Processor may have many Custody Transfer Points. Each Custody Transfer Point may have many Gas Processors.

Gatherer/Transporter

Many : Many. Each Gatherer/Transporter may have many Custody Transfer Points. Each Custody Transfer Point may have many Gatherer/Transporters.

Measurement Point

Many : Many. Each Measurement Point may be associated with many Custody Transfer Points. Each Custody Transfer Point may have many Measurement Points.

Meter Operator

Many : Many. Each Meter Operator may have many Custody Transfer Points. Each Custody Transfer Point may have many Meter Operators.

Remitter

Many : Many. Each Remitter may remit for many Custody Transfer Points. Each Custody Transfer Point may have many Remitters.

Reporter

Many : Many. Each Reporter may report for many Custody Transfer Points. Each Custody Transfer Point may have many Reporters.

Well Completion

Many : One. Production volumes from one to many Well Completions are transferred from the Operator to the Gatherer/Transporter at the Custody Transfer Point.

*Entity Name***Division of Interest***Description*

Sets of 100% ownership groupings that specify the sharing of revenue and expenses among the owners of a well completion

Aliases

DOI
Division Order

*Relationships**Entity**Relationship to Division of Interest*

Owner

Many : Many. Each Owner may be part of many Division of Interest groups (for different Well Completions).. Each Division of Interest may contain many Owners for a particular Well Completion.

Well Completion

One : One. Each Well Completion may have divided interests based on the Owners in one Division of Interest. A Well Completion has one Division of Interest, and the Division of Interest refers to one Well Completion.

Entity Name**First Purchaser****Description**

The business associate who agrees to purchase oil or gas volumes from designated wells or leases.

Aliases**Relationships****Entity****Relationship to First Purchaser**

Gatherer / Transporter

Many : Many. Many Gatherer/Transporters may have the same First Purchaser. Each Gatherer/Transporter may have many First Purchasers.

Sales Contract

Many : One. Many Sales Contracts may have the same First Purchaser. Each Sales Contract will have one First Purchaser.

Entity Name**Gas Processor****Description**

The business associate who processes natural gas in order to prepare it for sale to consumers.

Aliases**Relationships****Entity****Relationship to Gas Processor****Custody Transfer Point**

Many : Many. Each Custody Transfer Point may have many Gas Processors. Each Gas Processor may have many Custody Transfer Points.

Gatherer/Transporter

Many : Many. Each Gatherer/Transporter may have many Gas Processors. Each Gas Processor may have many Gatherer/Transporters.

Lease Delivery System

Many : Many. Each Lease Delivery System may have many Gas Processors. Each Gas Processor may be associated with many Lease Delivery Systems.

Entity Name**Gatherer / Transporter****Description**

The business associate who gathers and/or transports oil or gas volumes to a market.

Aliases**Relationships****Entity****Relationship to Gatherer/Transporter****Custody Transfer Point**

Many : Many. Each Custody Transfer Point may have many Gatherer/Transporters, Each Gatherer/Transporter may have many Custody Transfer Points.

First Purchaser

Many : Many. Each First Purchaser may have many Gatherer/Transporters. Each Gatherer/Transporter may have many First Purchasers.

Gas Processor

Many : Many. Each Gas Processor may be associated with many Gatherer/Transporters. Each Gatherer/Transporter may be associated with many Gas Processors.

Lease Delivery System

Many : Many. A Lease Delivery System may have many Gatherer/Transporters. Each Gatherer/Transporter may be associated with many Lease Delivery Systems.

Entity Name**Lease****Description**

1. A legal document executed between a landowner (lessor) and a company or individual (lessee) that grants the right to drill and operate oil and gas wells. 2. A legally defined area of land where production wells, stock tanks, separators and other production equipment are located.

Aliases**Relationships**

<u>Entity</u>	<u>Relationship to Lease</u>
Lessee	Many : Many. Each Lessee may have many Leases. Each Lease may have many Lessees.
Lessor	Many : Many. Each Lessor may have many Leases. Each Lease may have many Lessors.
Well Completion	Many : One. Each Well Completion is part of one Lease. Each Lease may have many Well Completions.

Entity Name

Lease Delivery System

Description

A series of production equipment required to deliver volumes from a producing well completion to a custody transfer or sales point.

AliasesRelationships

<u>Entity</u>	<u>Relationship Lease Delivery System</u>
Compression	Many : One. Many Compression points may be associated with each Lease Delivery System.
Custody Transfer Point	Many : One. Many Custody Transfer Points are within each Lease Delivery System.
Lease/Line Loss	Many : One. Many Lease/Line Loss Points are associated with each Lease Delivery System
Lease Use	Many : One. Many Lease Use points are associated with one Lease Delivery System.
Measurement Point	Many : One. Many Measurement Points are associated with each Lease Delivery System .
Meter Operator	One : Many. Each Meter Operator may deal with many Lease Delivery Systems. Each Lease Delivery System will have only one Meter Operator.
Remitter	Many : Many. Each Remitter may be associated with many Lease Delivery Systems. Each Lease Delivery System may have many Remitters.
Reporter	Many : Many. Each Reporter may be associated with many Lease Delivery Systems. Each Lease Delivery System may have many Reporters.
Gas Processor	Many : Many. Each Gas Processor may deal with many Lease Delivery Systems Each Lease Delivery System may have many Gas Processors..

Entity Name**Lease Delivery System (continued)****Relationships**

<u>Entity</u>	<u>Relationship to Leased Delivery System</u>
Gatherer/Transporter	Many : Many. Each Gatherer/Transporter may deal with many Lease Delivery Systems Each Lease Delivery System may have many Gatherer/Transporters..
Well Completion	Many : Many. Many Well Completions can be associated with each Lease Delivery System. Each Well Completion may be associated with many Lease Delivery Systems.

Entity Name**Lease Use****Description**

Oil or gas production volumes that are used on the lease prior to production being removed from the lease.

Aliases**Relationships****Entity****Lease Delivery System****Relationship to Lease Use**

One : Many. Each Lease Delivery System may have many Lease Use Points.

Entity Name**Lease/Line Loss****Description**

The point at which oil or gas production is lost due to leakage, shrinkage or other factors before production volumes are removed from the lease.

Aliases**Relationships****Entity**

Lease Delivery System

Relationship to Lease/Line Loss

One : Many. Each Lease Delivery System may have many Lease/Line Loss Points.

Entity Name

Lessee

Description

The person entitled under an oil and gas lease to drill and operate wells, paying the lessor a royalty and retaining the remainder.

Aliases**Relationships****Entity****Relationship to Lessee**

Lease

Many : Many. Each Lease may have many Lessees. Each Lessee may drill and operate many Leases.

Entity Name

Lessor

Description

The owner of mineral rights who has executed a lease. He is normally entitled to payment of a royalty on production, except taxes on his share of production.

Aliases**Relationships****Entity****Relationship to Lessor**

Lease

Many : Many. Each Lease may have many Lessors. Each Lessor may drill and operate many Leases.

Entity Name**Measurement Point****Description**

The point at which production volumes are measured.

Aliases

Meter

Relationships**Entity****Relationship to Measurement Point**

Custody Transfer Point

Many : Many. A Custody Transfer Point may have many associated Measurement Points. A Custody Transfer Point may be the same as the Measurement Point.

Lease Delivery System

One : Many. Each Lease Delivery System may have many Measurement Points.

Meter Operator

One : Many. A Meter Operator may operate many Measurement Points within a Lease Delivery System. Each Measurement Point will have only one Meter Operator.

Remitter

Many : Many. A Remitter may be associated with many Measurement Points. Each Measurement Point may be associated with many Remitters.

Reporter

Many : Many. A Reporter reports volumes measured at the Measurement Point to the appropriate state regulatory agency. Each Reporter may report for many Measurement Points.

Entity Name**Meter Operator**Description

The business associate who measures oil and gas production volumes after they are produced.

Aliases

First Measurer

RelationshipsEntityRelationship to Meter Operator

Custody Transfer Point

Many : One. Many Custody Transfer Points may be associated with each Meter Operator. Each Custody Transfer Point will have only one Meter Operator.

Measurement Point

Many : One. Many Measurement Points may be associated with each Meter Operator. Each Measurement Point will have only one Meter Operator.

Entity Name

Operator

Description

1. A person or company engaged in the business of drilling oil and gas wells. 2. A person or company, either proprietor or lessee, actually operating a well or lease.

AliasesRelationships

<u>Entity</u>	<u>Relationship to Operator</u>
Permit	Many : One. Many Permits may be issued to each Operator. Each Permit will be issued to only one Operator.
Well Bore	Many : One. Many Wells (Well Bores) may be operated by each Operator. Each well will have only one Operator for a given period of time.

Entity Name

Owner

Description

A person who owns an interest in the oil or gas production from a well completion.

AliasesRelationshipsEntityRelationship to Owner

Division of Interest

Many : Many. A Division of Interest may include many Owners. Each Owner may be part of many Division of Interest lists (for different Well Completions).

Sales Contract

Many : One. Many Sales Contracts may be associated with one Owner. Each Sales Contract will be associated with only one Owner.

Entity Name**Perforated Interval****Description**

The subsurface interval within a well completion in which the casing and cement (if present) have been perforated or pierced in order to allow formation fluids to enter the well bore.

Aliases**Relationships****Entity****Relationship to Perforated Interval**

Reservoir

Many : Many. Each Reservoir may have many Perforated Intervals. Each Perforated Interval may span more than one Reservoir.

Well Completion

One : Many. Each Well Completion may have many Perforated Intervals.

Entity Name**Permit**Description

The authorization from the state regulatory agency to drill a new well or to re-complete or re-enter an existing well bore.

AliasesRelationships

<u>Entity</u>	<u>Relationship to Permit</u>
Operator	One : Many. Each Operator may have many Permits.
Spacing	Many : Many. Each Spacing requirement for the state may affect the approval/rejection of many Permits. Each Permit will be evaluated based on Spacing requirements for the state including general state spacing requirements, and field and pool spacing requirements if applicable.
Well Bore	One : Many. Each Well Bore has at least one Permit. If the well is re completed, the Well Bore may have many Permits.
Well Completion	Many : Many. Each Well Completion is associated with a Permit. One Permit may be associated with many Well Completions within one well bore.

Entity Name**Production History****Description**

Historical production data for a well completion.

Aliases**Relationships****Entity****Relationship to Production History**

Allowable

One : One. Each Allowable assignment considers the Production History of the Well Completion. Production History for surrounding well completions, pools, or fields also may be considered in determining the Allowable.

Well Completion

One : One. Each producing Well Completion has a Production History.

Entity Name**Remitter****Description**

The business associate who remits tax or royalty payments to the appropriate state regulatory agency.

Aliases**Relationships****Entity****Relationship to Remitter****Custody Transfer Point**

Many : Many. Each Custody Transfer Point may have many Remitters. Each Remitter may have many Custody Transfer Points.

Lease Delivery System

Many : Many. Each Lease Delivery System may have many Remitters. Each Remitter may be associated with many Lease Delivery Systems.

Measurement Point

Many : Many. Each Measurement Point may have many Remitters. Each Remitter may have many Custody Transfer Points.

Well Completion

Many : Many. Each Well Completion may have more than one Remitter. Each Remitter may remit tax or royalty payments for many Well Completions.

Entity Name

Reporter

Description

The business associate who reports production volumes to the appropriate state regulatory agency.

AliasesRelationships

<u>Entity</u>	<u>Relationship to Reporter</u>
Custody Transfer Point	Many : Many. Each Custody Transfer Point may have many Reporters. Each Reporter may have many Custody Transfer Points.
Lease Delivery System	Many : Many. Each Lease Delivery System may have many Reporters. Each Reporter may be associated with many Lease Delivery Systems.
Measurement Point	Many : Many. Each Measurement Point may have many Reporters. Each Reporter may have many Custody Transfer Points.
Well Completion	Many : Many. Each Well Completion may have more than one Reporter. Each Reporter may report production volumes for many Well Completions.

Entity Name**Reservoir****Description**

The subsurface porous, permeable rock body in which oil or gas or both are stored.

Aliases**Relationships****Entity****Relationship to Reservoir**

Perforated Interval

Many : Many. Each Perforated Interval may be associated with more than one Reservoir. Each Reservoir may have many Perforated Intervals.

Well Completion

Many : One. Each Well Completion is associated with one Reservoir. Many Well Completions are within the same Reservoir.

Entity Name**Sales Contract****Description**

The legal document that defines the conditions for transfer of property (oil or gas production volumes) for money or credit between the Owner and the First Purchaser.

Aliases**Relationships****Entity****Relationship to Sales Contract**

Owner

One : Many. Each Owner may have many Sales Contracts for the sale of production volumes.

First Purchaser

One : Many. Each First Purchaser may have many Sales Contracts for the purchase of production volumes.

Entity Name**Spacing****Description**

The area allocated to a well completion as defined by the state regulatory agency. Spacing may be based on acreage, productive capacity, general spacing rules of the state or field or pool spacing requirements.

Aliases

Well Spacing

Relationships**Entity****Relationship to Spacing**

Permit

Many : Many. Each Permit will be evaluated based on Spacing requirements for the state including general state spacing requirements, and field and pool spacing requirements if applicable. Each Spacing requirement for the state may affect the approval/rejection of many Permits.

Well Completion

One : One. Each Well Completion is associated with the Spacing requirements of the state including general spacing requirements, and field and pool spacing.

Entity Name**Tax Group****Description**

An entity defined by the state revenue agency. A tax group may consist of one to many well completions. Production is usually reported to the state revenue agency at the tax group level.

Aliases

Production Unit Number (PUN)

Relationships**Entity****Relationship to Tax Group**

Well Completion

Many : One. Many Well Completions can be assigned to each Tax Group.

Entity Name**Tract****Description**

A grouping of wells that share a common ownership percentage of the overall unit.

Aliases**Relationships****Entity****Relationship to Tract****Unit**

One : Many. Each Unit may be composed of many Tracts.
Each Tract will be included in only one Unit.

Well Completion

Many : One. Many Well Completions may be included in
each Tract. Each Well Completion will be included in only
one Tract.

Entity Name

Unit

Description

The total area incorporated in a unitization agreement.

AliasesRelationships

<u>Entity</u>	<u>Relationship to Unit</u>
Tract	Many : One. Many Tracts may be contained within each Unit. Each Tract will be included in only one Unit.
Well Completion	Many : One. Many Well Completions may be included in each Unit. Each Well Completion will be included in only one Unit (if the area is unitized).

Entity Name**Well Bore****Description**

A hole in the ground made by drilling, from which oil or gas production may be obtained.

Aliases**Relationships****Entity****Relationship to Well Bore**

Permit

Many : One. Many Permits may be associated with each Well Bore (if the well is re-completed or re-entered). Each Permit will be associated with only one Well Bore.

Well Completion

Many : One. Many Well Completions may exist for each Well Bore. Each Well Completion is within one Well Bore.

Entity Name

Well Completion

Description

The subsurface location from which oil or gas is or has been produced from a reservoir.

AliasesRelationships

<u>Entity</u>	<u>Relationship to Well Completion</u>
Allowable	One : One. Each Well Completion has one Allowable assigned for a given period of time.
Custody Transfer Point	One : Many. Production volumes from one to many Well Completions are transferred from the Operator to the Gatherer/Transporter at the Custody Transfer Point
Division of Interest	One : One. Each Well Completion may have divided interests based on the Owners in one Division of Interest. A Well Completion has one Division of Interest, and the Division of Interest refers to one Well Completion.
Lease	One : Many. Each Lease may have many Well Completions. Each Well Completion is part of one Lease.
Lease Delivery System	One : Many. Many Well Completions can be associated with each Lease Delivery System.
Measurement Point	Many : Many. Each Measurement Point may be associated with many Well Completions. Each Well Completion may have many Measurement Points.
Perforated Interval	Many : One. Each Well Completion may have many Perforated Intervals.
Permit	Many : Many. Each Well Completion is associated with a Permit, and may be associated with many Permits if the well is re-completed. One Permit may be associated with many Well Completions within one well bore.
Production History	One : One. Each producing Well Completion has a Production History.

Entity Name

Well Completion (continued)

Relationships

<u>Entity</u>	<u>Relationship to Well Completion</u>
Remitter	Many : Many. Each Well Completion may have more than one Remitter. Each Remitter may remit tax or royalty payments for many Well Completions.
Reporter	Many : Many. Each Well Completion may have more than one Reporter. Each Reporter may report production volumes for many Well Completions.
Reservoir	One : Many. Each Well Completion is associated with one Reservoir. Many Well Completions are within the same Reservoir.
Spacing	One : One. Each Well Completion is associated with the Spacing requirements of the state including general spacing requirements, and field and pool spacing.
Tax Group	One : Many. Many Well Completions can be assigned to each Tax Group. Each Well Completion is assigned to one Tax Group.
Tract	One : Many. Each Tract may include many Well Completions. Each Well Completion will be included in only one Tract.
Unit	One : Many. Each Well Completion will be included in only one Unit (if the area is unitized). Many Well Completions may be included in each Unit.
Well Bore	One : Many. Many Well Completions may exist for each Well Bore. Each Well Completion is within one Well Bore.
Well Test	Many : One. Many Well Tests are run for each Well Completion. Each Well Completion may have many Well Tests.

Entity Name

Well Test

Description

The test of a well's productive capacity under standard conditions such as pressure and temperature. Examples include the Back Pressure Test, the One Point Test, the Four-Point Test, Shut-in Test and Absolute Open Flow Test.

Aliases

Deliverability Test

RelationshipsEntityRelationship to Well Test

Allowable

One : One. Each Allowable for a Well Completion is based on the latest Well Test in conjunction with other factors such as Production History, Conservation Technical Factors, etc.. Allowables are determined and set for a specific period of time based on all these factors.

Well Completion

One : Many. Each Well Completion may have many Well Tests.

Appendix B

Uniform Production Reporting Model

Implementation Requirements

APPENDIX B

IMPLEMENTATION REQUIREMENTS

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INTRODUCTION

In order to properly assess the feasibility of implementing the Conceptual Model presented by the Uniform Production Reporting Model (UPRM) project, it is necessary to identify the costs of such an implementation. The estimates presented here are high-level and are intended to be an order-of-magnitude approximation of the requirements for implementation on a national basis.

This section provides a step-by-step walk-through of the methodology for developing the estimates and also presents the critical assumptions and disclaimers. Because this is a detailed walk-through, it is important to provide the results of intermediate calculations with no rounding to take into account the order-of-magnitude nature of the estimates.

Please note that this section, Appendix B, focuses on the requirements for a *national* implementation of the UPRM. Attachment B.1 presents the detailed cost approximation for a single *representative state*.

ASSUMPTIONS

General

- Only core functionality is to be developed, with some additional cost required to interface to existing or separately-developed non-core functionality. The development requirements of any non-core functionality are specifically excluded.
- These estimates represent a *complete* development of core functionality in a state that chooses to implement all of the Uniformity Guidelines.
- Application software will be custom-developed. Note that the type of solution used in each state may vary due to state size, statutory complexity, etc. No assumption is made regarding the specific technology or application solution used. For example, larger states may require a mainframe-based solutions due to transaction volume and smaller states may require simple spreadsheets for capture and summarization of data.
- The three primary agencies (Conservation, Royalty, Tax) participate in the joint-development of the system and provide appropriate personnel resources.
- The system is developed in a central location, involving three physical locations; one for each primary agency.
- All major processes are performed electronically. Note that this approach may not be economically feasible for states with special statutory requirements or for states with a small number of wells and/or small production volumes.
- The selected subset of on-line screens provided to external data users through External Data Sharing will utilize the same screens used by state agency employees; no special screens will be developed.
- Approximately 20% of the total work-days will be performed by state employees; with the balance being performed by external labor.

- State labor costs are approximately \$250 per day, on average. This cost includes salary, benefits, retirement, holidays, and vacations.
- External labor costs are assumed to be \$1,000 per day, on average. This cost includes hourly fees, travel expenses, and housing expenses.

Work Plan

- A 24 month development life cycle is assumed.
- The development life assumes that hardware and systems software have already been selected, ordered, and installed. Note that this selection/order/install cycle may require up to 1 year or more in many states.
- The major phases in a typical systems development life cycle that are addressed include:
 - ***Systems Analysis and Design.*** This is the phase in which major system functions and features are finalized. In addition, the business processes are re-designed and the technical architecture is designed and developed.
 - ***Systems Installation.*** In this phase, program specifications are finalized and individual programs are coded and tested. Data conversion takes place and the final system is tested and installed.
- Ongoing maintenance requirements are specifically excluded from the estimates.

Assumed Process Inventory

- Includes only core processes; specifically excludes non-core processes.
- Process counts are taken from the UPRM function descriptions.
- Given the very high-level nature of these estimates, it is necessary to make a very broad assumption regarding the complexities of core processes. The following distribution outlines the assumed mixture:
 - Easy15%
 - Medium70%
 - Difficult15%

DISCLAIMERS

- The estimates provided are very high-level.
- Estimates are prepared as a baseline starting point only. These estimates do not reflect any specific state's anticipated costs.
- Cost estimates are the *anticipated* costs. Actual costs may be lower for any combination of the following reasons:
 - Some states may have already implemented many of the Uniformity Guidelines.
 - Some states may choose not to implement *any* of the Uniformity Guidelines.
 - Some states may choose to only partially implement the Uniformity Guidelines due to the following reasons:
 - *Not all guidelines are appropriate for the state.*
 - *Not all agencies within the state choose to participate.*
- Cost estimates represent the total cost to implement UPRM concepts in the primary state agencies involved with the natural gas and oil industry (Conservation, Royalty, and Tax). This total cost is *public-sector* cost only; no estimates are provided for any change-over required by industry in reacting to state-specific changes.
- Should a state decide to pursue the implementation of the Uniform Production Reporting Model, in whole or in part, these estimates should be used as only a broad first-cut. Each state should prepare its own detailed cost requirements, taking into account:
 - State-specific statutory requirements.
 - Degree of anticipated adoption of the Uniformity Guidelines.
 - The condition of the state's current procedures and information systems.
 - The degree of interface requirements to non-core functionality.
- Cost estimates are based on industry and state government averages and do not represent the normal rates of any specific state agency or consulting firm.
- No assumption is made as to the source of the external labor being provided to each state.
- No assumption is made regarding the source of funding.

- No assumption is made regarding the timing of implementation.
- No assumption is made for inflation due to implementation over an extended period. Note that all dollar figures and averages are presented in 1993 dollars.

METHODOLOGY

Introduction

The methodology used here has been developed for providing a picture of the requirements for implementing the Uniformity Guidelines on a *national* basis. The approach involves determining the cost for a hypothetical state, and then extrapolating this cost to the other producing states. The methodology can be summarized as follows:

1. Estimate the implementation requirements for a hypothetical state.
2. Define state tier groups to account for differences in state characteristics.
3. Extrapolate the implementation requirements for the hypothetical state (see step 1) to the states in other tiers.

Define Implementation Requirements for a Hypothetical State

The requirements of implementation for a hypothetical state were estimated for a fairly large state with approximately 40,000 producing wells. The following components were estimated during this process:

- Labor requirements during the design and installation phases of the system development life cycle.
- Hardware and system software requirements of the new system.

UPRM Estimates

The estimates prepared by the UPRM project team are based on Andersen Consulting's METHOD/1® estimating methodology. The estimates were prepared in a "top-down" style and are presented in detail in Attachment B.1. The results have been summarized in the following table:

<i>UPRM Cost Estimates</i>								
Labor Costs								
	Work-Days			Daily Costs, \$		Total Costs, \$		
	State Labor	External Labor	Total	State Labor	External Labor	State Labor	External Labor	Total
Analysis & Design	964	3,855	4,819	\$250	\$1,000	\$240,930	\$3,854,880	\$4,095,810
Implementation	2,747	10,990	13,737	\$250	\$1,000	\$686,850	\$10,989,600	\$11,676,450
	3,711	14,844	18,556			\$927,780	\$14,844,480	\$15,772,260
Hardware/System Software Costs								
Assume a Baseline Cost of \$1,000,000. This assumes an entry-level mainframe with all appropriate system and database software. This mainframe is of a size appropriate for handling the volume of processing associated with a state with approximately 40,000 wells.								
SUMMARY								
Labor Costs.....				\$15,772,260				
Hardware/System Software Costs.....				\$1,000,000				
TOTAL.....				\$16,772,260				

Again, these estimates were prepared for a generic, hypothetical state. While the estimates are based on an extremely sound methodology with a strict set of assumptions, it is important to validate them against a comparable "known", if one exists. The next section discusses the selection of a comparable state and the results of comparing the UPRM estimates to those of the comparable state.

Comparable State Comparison

State Selection. In order to validate the UPRM estimates, it was necessary to find a suitable state that met the following criteria relative to the hypothetical state:

- The state has a comparable number of wells.
- The state has installed similar functionality.
- This functionality has been installed relatively recently.

New Mexico's ONGARD® project was chosen for the comparison because it met the required criteria.

Comparison. The range of costs presented here were verified with the State of New Mexico's system development costs associated with its ONGARD® system. Specifically:

ONGARD® - Known Costs

- The External Labor cost to New Mexico will be approximately \$18 million. This cost includes all contract fees and expenses associated with the design, development, and implementation of ONGARD®.
- The hardware and system software costs required to implement ONGARD® were approximately \$1 million.

ONGARD® - Estimated Costs

This cost does not include state employee labor costs. The following calculations were used to approximate the costs of state labor in the ONGARD® development effort:

- Approximately 25% of the labor for the project was provided by state employees.
- The number of work-days provided by state employees can be calculated as follows:
 - *External labor costs were \$18 million.*
 - *Assuming a daily cost of \$1,000, a total of 18,000 work-days were provided by external labor.*
 - *This 18,000 work-days is 75% of the total labor requirements, meaning that a total of 24,000 work-days were provided to the project.*
 - *State labor requirements must therefore be 6,000 work-days.*
- Assuming a daily cost of \$250 for state employees, the total state labor cost must be $\$250/\text{day} \times 6,000 \text{ days} = \$1,500,000$.

ONGARD® - Total Costs

- The total cost should be composed of:

Hardware/System Software	\$1,000,000
External Labor	\$18,000,000
State Labor	\$1,500,000
TOTAL.....	\$20,500,000
- Total cost should be approximately \$20.5 million over the project's life.

The UPRM cost estimates presented here account for only *core* functionality, or approximately 80% of the total system functionality. Given the total costs associated with ONGARD®, core functionality should probably cost approximately 80% of \$20 million or \$16.4 million.

The UPRM cost estimate of \$16.7 million is within 2% of the ONGARD® estimate for core functionality, verifying the order-of-magnitude estimates prepared by the UPRM project team.

Note that the comparisons made to the ONGARD® costs were performed by the UPRM project team. These cost estimates were not audited or externally verified, although they are believed to be accurate and reliable.

Define State Tier Groups

Intuitively, it is apparent that the implementation effort associated with implementing the UPRM Conceptual Model in a large state will be greater than in a small state. Rather than preparing estimates of implementation requirements for *each individual* state, the UPRM project chose to prepare estimates for a hypothetical state and then extrapolate these estimates to the remaining producing states.

This approach requires a quantifiable basis for extrapolation that predicts the cost of implementation in states of various sizes. The definition of this basis involved the identification of candidate *cost drivers* and the selection of the single cost driver for use in extrapolation. Once the single cost driver had been identified, producing states were grouped into similar groups or *tiers* for the purposes of extrapolation.

Identify Cost-Drivers

The level of difficulty of developing a system that fully implements the UPRM guidelines will vary from state-to-state, depending on the complexities of each specific state. The following have been identified as candidate cost-drivers for the purposes of extrapolating implementation requirements from the representative tier:

- Average number of production (i.e., Conservation) transactions received per month
- Average number of Royalty transactions received per month
- Average number of Tax transactions received per month
- Average monthly production
- Number of producing wells

All of these cost-drivers indicate the normal work-load to a specific state as it manages its oil and gas resources.

Select Appropriate Cost-Driver

The list of cost-drivers previously identified includes several viable candidates, but only one cost-driver can be used for purposes of extrapolation. Given this requirement, it is necessary to define the characteristic of the *best* cost-driver for use in extrapolation. The following rules were defined for identifying the best cost-driver:

- It must be a reasonable predictor of state processing complexity and therefore of implementation difficulty;
- It must be quantifiable;
- Data must be readily available and consistent across producing states.

Given these constraints, the best cost-driver for this effort is the number of producing wells. While other candidates may meet one or more of the constraints, only the number of producing wells met all criteria.

Define Tiers Based on Number of Producing Wells

The producing states were divided into tiers based on their relative numbers of producing wells. The following table summarizes the assignment of states to tiers:

Definition of Tiers Based on 1991 Producing Wells

Tier 1...Average Number of Wells = 236,468

Texas	236,468
-------	---------

Tier 2...Average Number of Wells = 129,654

Oklahoma	129,654
----------	---------

Tier 3...Average Number of Wells = 59,476

Kansas	66,576
Ohio	64,802
West Virginia	53,800
Pennsylvania	52,727

Tier 4...Average Number of Wells = 37,797

California	44,878
Louisiana	38,883
New Mexico	37,659
Kentucky	34,938
Illinois	32,628

Tier 5...Average Number of Wells = 9,887

Wyoming	14,441
Colorado	11,380
Arkansas	11,230
New York	9,630
Indiana	8,851
Michigan	7,128
Montana	6,552

Tier 6...Average Number of Wells = 2,646

Alabama	4,280
North Dakota	3,856
Utah	3,045
Mississippi	2,521
Nebraska	1,763
Alaska	1,671
Tennessee	1,386

Tier 7...Average Number of Wells = 270

Virginia	911
Missouri	852
South Dakota	208
Florida	90
Nevada	50
Arizona	28
Oregon	16
Maryland	7

Source: API's "Petroleum Industry Statistics", Volume XIII, Number 2, May 1993.

Representative Tier. Because the hypothetical state originally defined in the UPRM estimates contained 40,000 producing wells, Tier 4 will be used as the *representative tier* for purposes of comparison and extrapolation.

Extrapolate Representative Tier Requirements to Other Tiers

Calculate Baseline Requirements for Representative Tier

Labor Requirements. Using the UPRM estimates, the baseline labor requirements are 18,556 work-days. The baseline per-well estimate was calculated as follows, using Tier 4 as the representative tier:

- Work-Days = 18,556
- Number of Wells = 37,759
- Average Work-Days per Well = 0.49

Hardware/System Software Requirements. Using the UPRM estimates, the baseline hardware/system software cost is \$1 million. The baseline per-well cost was calculated as follows, using Tier 4 as the representative tier:

- Cost = \$1,000,000
- Number of wells = 37,797
- Average Hardware/System Software Cost per Well = \$26.46

Extrapolate Requirements to Remaining Tiers

Labor Requirements: Work-Days. Note that because of economies-of-scale, the baseline estimate is inappropriate for use with all states without some adjustment. For example, the per-well cost of implementation in Tier 1 states (average number of wells = 236,468) should be significantly lower than in Tier 7 states (average number of wells = 270). Because of this, each tier above and below the representative tier (Tier 4) is adjusted by a factor of 35% -- relative to the next tier nearer the representative tier. For example, for tiers *above* Tier 4:

- Tier 3 per-day requirements are = $(100-35\%)$ of 0.49 = 0.32
- Tier 2 per-day requirements are = $(100-35\%)$ of 0.32 = 0.21
- Tier 1 per-day requirements are = $(100-35\%)$ of 0.21 = 0.14

Conversely, tiers *below* Tier 4 are as follows:

- Tier 5 per-day requirements are = $(100+35\%)$ of $0.49 = 0.67$
- Tier 6 per-day requirements are = $(100+35\%)$ of $0.67 = 0.90$
- Tier 7 per-day requirements are = $(100+35\%)$ of $0.90 = 1.21$

Adjusting the work-day per well requirements yields the following distribution of requirements across the seven tiers:

Once the per-day requirements were calculated, the total work days for the tier could be calculated. The following figure illustrates the calculations used:

Extrapolate Work-Day Requirements

<i>Tier Information</i>			<i>Account for Economies-of-Scale</i>				
1	2	3	4	5	6	7	8
Tier #	# of States	Avg # of Wells	Begin Wkdays Per Well	Adjust Wkdays Per Well	Net Wkdays Per Well	Net Wkdays Per Avg State	Tier's Total Wkdays
1	1	236,468	0.21	-35%	0.14	31,998	31,998
2	1	129,654	0.32	-35%	0.21	26,992	26,992
3	4	59,476	0.49	-35%	0.32	19,049	76,196
4	5	37,797	0.49	0%	0.49	18,556	92,780
5	7	9,887	0.49	+35%	0.67	6,577	46,040
6	7	2,646	0.67	+35%	0.90	2,376	16,633
7	8	270	0.90	+35%	1.21	328	2,621
							293,260

Notes on Specific Column Numbers:

- (3) Contains the average number of producing wells for the tier in 1991.
- (4) The number of workdays per well prior to adjustment for economies-of-scale. This value is taken from column 6 of the next tier nearer the representative tier (Tier #4).
Examples:
Tier 1: is equal to the Net Workdays per Well (Column 6) for Tier 2
Tier 2: is equal to the Net Workdays per Well (Column 6) for Tier 3.
Tier 7: is equal to the Net Workdays per Well (Column 6) for Tier 6
- (5) Contains a consistent adjustment factor to allow for economies of scale. This adjustment reflects the lower per-well costs incurred by larger states relative to smaller states.
- (6) Applies the adjustment factor in column 5 to the beginning work days in column 4.
- (7) Contains the net work-days of labor required by an average state within the specific tier. It is calculated by multiplying Column 3 by Column 6.
- (8) Contains the total work-days of labor required for the tier. It is calculated by multiplying Column 2 by Column 7.

Labor Costs. The cost requirements can be calculated using an assumed mixture of state and external labor and an assumed cost for each.

The development of a system of this magnitude normally requires more full-time personnel than the average state has available. For this reason, most states bring in outside assistance from consulting firms, programming houses, etc. An average project distribution of labor is:

- State labor = 20%
- External labor = 80%

This ratio will obviously depend upon an individual state's situation, availability of resources, the size of the project, etc.

While the costs of state and external labor can vary significantly, the following state and industry averages are assumed for developing the final cost estimates:

- Per work-day state labor costs = \$250
This includes salary, benefits, vacation, holidays, etc.
- Per work-day external labor costs = \$1,000
This includes hourly fees, travel expenses, housing, expenses, etc.

Again, the actual costs will vary depending on state, source and quality of external labor, etc.

Using the assumed labor source ratios and daily cost rates, labor costs can be calculated as follows:

Calculate Labor Costs

Tier Information		Assume Labor Source		Assume Daily Costs			
1	2	3	4	5	6	7	8
Tier #	# of States	Tier's Total Wkdays	State Labor 20%	External Labor 80%	State Work-Day Cost \$250	External Work-Day Cost \$1,000	Total Labor Cost \$
1	1	31,998	6,400	25,599	1,599,919	25,598,706	27,198,625
2	1	26,992	5,398	21,593	1,349,579	21,593,259	22,942,838
3	4	76,196	15,239	60,957	3,809,803	60,956,847	64,766,650
4	5	92,780	18,556	74,224	4,639,000	74,224,000	78,863,000
5	7	46,040	9,208	36,832	2,301,976	36,831,613	39,133,588
6	7	16,633	3,327	13,306	831,651	13,306,413	14,138,063
7	8	2,621	524	2,097	131,052	2,096,827	2,227,878
		293,260	58,652	234,608	14,662,979	234,607,664	249,270,643

Notes on Specific Column Numbers:

- (3) Contains the total number of work-days required to implement core UPRM functionality.
- (4) Contains the portion of the tier's total work-days to be performed by state employees. Assumes that 20% of the work is done by state labor. Calculated by multiplying 20% by Column 3.
- (5) Contains the portion of the tier's total work-days to be performed by external labor. Assumes that 80% of the work is done by external labor. Calculated by multiplying 80% by Column 3.
- (6) Contains the cost of the work performed by state labor. Calculated by multiplying the assumed daily rate of \$250 by Column 4.
- (7) Contains the cost of the work performed by external labor. Calculated by multiplying the assumed daily rate of \$1,000 by Column 5.
- (8) Contains the total labor cost. Calculated by adding Columns 6 and 7.

Hardware/System Software Cost. These costs are extrapolated from the representative state on a \$-per-well basis. This approach is used to reflect the wide range in computing power required by states with vastly different numbers of wells. The following diagram summarizes the costs for all tiers:

Extrapolate Hardware/System Software Costs					
Tier Information					
1	2	3	4	5	6
Tier #	# of States	Avg # of Wells	HW/SSW Costs Per Well \$	HW/SSW Costs Per Avg State \$	Total HW/SSW Cost \$
1	1	236,468	26.46	6,260,000	6,260,000
2	1	129,654	26.46	3,430,000	3,430,000
3	4	59,476	26.46	1,570,000	6,280,000
4	5	37,797	26.46	1,000,000	5,000,000
5	7	9,887	26.46	260,000	1,820,000
6	7	2,646	26.46	70,000	490,000
7	8	270	26.46	10,000	80,000
					23,360,000

Notes on Specific Column Numbers:	
(3)	Contains the average number of producing wells for the tier in 1991.
(4)	The hardware/system software (HW/SSW) costs per well. This value was calculated from the representative state: Hardware/system software cost...\$1,000,000 Number of wells...37,797 Average HW/SSW cost per well: \$26.46
(5)	The hardware/system software costs for an average state in the tier. Calculated by multiplying Column 3 by Column 4.
(6)	The total hardware/system software costs for all states in the tier. Calculated by multiplying Column 2 by Column 5.

SUMMARY

The estimates presented in this section are provided as an order-of-magnitude approximation of the actual requirements of implementing the Uniformity Guidelines defined by the Uniform Production Reporting Model (UPRM). While the estimates are appropriate at a national level, the individual components, or estimates for specific states should be used as a starting point only.

The following tables summarize the implementation requirements:

UPRM Implementation Requirements

Summary

Tier #	Labor						Hardware	
	Work-Days			Costs, \$			Tier's Total HW/SSW Cost \$	Tier's Total Costs \$
	State Labor 20%	External Labor 80%	Tier's Total Wkdays	State Wkday Costs \$250	External Wkday Costs \$1,000	Tier's Total Labor Costs, \$		
1	6,400	25,599	31,998	\$1,599,919	\$25,598,706	\$27,198,625	\$6,260,000	\$33,458,625
2	5,398	21,593	26,992	\$1,349,579	\$21,593,259	\$22,942,838	\$3,430,000	\$26,372,838
3	15,239	60,957	76,196	\$3,809,803	\$60,956,847	\$64,766,650	\$6,280,000	\$71,046,650
4	18,556	74,224	92,780	\$4,639,000	\$74,224,000	\$78,863,000	\$5,000,000	\$83,863,000
5	9,208	36,832	46,040	\$2,301,976	\$36,831,613	\$39,133,588	\$1,820,000	\$40,953,588
6	3,327	13,306	16,633	\$831,651	\$13,306,413	\$14,138,063	\$490,000	\$14,628,063
7	524	2,097	2,621	\$131,052	\$2,096,827	\$2,227,878	\$80,000	\$2,307,878
	58,652	234,608	293,260	\$14,662,979	\$234,607,664	\$249,270,643	\$23,360,000	\$272,630,643

Note: Grand totals are provided for illustrative purposes only, and do not reflect an anticipated nationwide implementation of the UPRM. It is expected that if nationwide implementation did occur, economies of scale could be realized and the cost could be considerably lower.

APPENDIX B

ATTACHMENT 1

Baseline Cost Requirements: Hypothetical State

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ESTIMATING METHODOLOGY

Introduction

The estimates prepared here are for a generic, *hypothetical* state. The assumed state is fairly large and contains an assumed 40,000 producing wells. The Andersen Consulting methodology METHOD/1® was used in preparing the order-of-magnitude cost approximations. These estimates were prepared using a "top-down" approach and are, by definition, very high-level.

METHOD/1®

Introduction

METHOD/1® is the project planning and estimation methodology developed and used by Andersen Consulting. It serves as the basis for approximating large-scale systems design and implementation efforts world-wide. It is Andersen's central repository of estimating guidelines and is continually updated to reflect new client experiences.

The methodology supports approximating systems development requirements at a variety of levels, depending on the level of detailed understanding of a given client and system to be developed. This flexibility was useful in this case, due to the high-level nature of the estimates being prepared.

Phases Estimated

Estimates were prepared for two major phases in the normal life cycle of systems development. The phases are:

- Systems Analysis and Design
- Systems Installation

Variables Taken Into Account

METHOD/1® provides guidelines for approximating *aggregate* development requirements for each phase given broad measures of system requirements. The following variables are taken into account:

- Number of automated applications
- Number of batch processes
- Number of reports
- Number of screens
- Project overhead

Estimating Approach

Step 1. Determine Total Work-Days Required for Development of Core Functions

METHOD/1® provides guidelines for determining the total number of work-days required to perform systems design and installation. The estimates are presented in aggregate, with no assumption made about *who* will perform what portion of the work.

Step 2. Determine Work-Days Required to Interface to Existing Systems

Even though the focus of this project is on the "core" functionality, it will be necessary to interface this new software with existing "non-core" functions. The interface requirements will be calculated as a percentage of the effort of implementing just the core functionality, using the following guidelines:

- Non-core functionality is specifically excluded from the estimates prepared in step 1.
- The interface requirements will be approximately 20% of the effort to develop the core functionality.

Step 3. Approximate Labor Costs

After determining the overall work-day requirements, it is possible to approximate the *cost* of implementation. This cost is approximated as follows:

- Assume what percentage of the total work will be performed by state versus external labor.
- Assume a daily cost of state and external labor.

Step 4. Assume Hardware/System Software Costs

Hardware and system software costs are assumed to be \$1 million. This figure is provided for completeness only and should be viewed as an order-of-magnitude approximation. The actual costs will vary by state, and will be dependent upon:

- Technology choice (mainframe, client-server, etc.)
- Number of users.
- Operational requirements (response time, etc.)

Please refer to Attachment B1(3) for the detailed calculations supporting the above methodology. The results of these detailed calculation is presented in the following section.

UPRM ESTIMATES

Work-Day Totals

Analysis and Design

State Labor	964
External Labor	3,855
	4,819

Installation

State Labor	2,747
External Labor	10,990
	13,737

TOTAL	18,556
--------------------	---------------

Financial Totals

Hardware/System Software	\$1,000,000
--------------------------------	-------------

Labor

State Labor	\$927,780
External Labor	\$14,844,480
	\$15,772,260

TOTAL	\$16,772,260
--------------------	---------------------

VERIFICATION OF ESTIMATES

Again, these estimates were prepared for a generic, *hypothetical* state. While the estimates are based on an extremely sound methodology with a strict set of assumptions, it is important to validate them against a comparable "known", if one exists. This section discusses the selection of a comparable state and the results of comparing the UPRM estimates to those of the comparable state.

State Selection

In order to validate the UPRM estimates, it was necessary to find a suitable state that met the following criteria relative to the hypothetical state:

- The state has a comparable number of wells.
- The state has installed similar functionality.
- This functionality has been installed relatively recently.

New Mexico's ONGARD® project was chosen for the comparison because it met the required criteria.

Comparison

ONGARD® - Known Costs

- The External Labor cost to New Mexico will be approximately \$18 million. This cost includes all contract fees and expenses associated with the design, development, and implementation of ONGARD®.
- The hardware and system software costs required to implement ONGARD® were approximately \$1 million.

ONGARD® - Estimated Costs

This cost does not include state employee labor costs. The following calculations were used to approximate the costs of state labor in the ONGARD® development effort:

- Approximately 25% of the labor for the project was provided by state employees.
- The number of work-days provided by state employees can be calculated as follows:
 - *External labor costs were \$18 million.*
 - *Assuming a daily cost of \$1,000, a total of 18,000 work-days were provided by external labor.*
 - *This 18,000 work-days is 75% of the total labor requirements, meaning that a total of 24,000 work-days were provided to the project.*
 - *State labor requirements must therefore be 6,000 work-days.*
- Assuming a daily cost of \$250 for state employees, the total state labor cost must be $\$250/\text{day} \times 6,000 \text{ days} = \$1,500,000$.

ONGARD® - Total Costs

- The total cost should be composed of:

Hardware/System Software	\$1,000,000
External Labor	\$18,000,000
State Labor	\$1,500,000
TOTAL	\$20,500,000

- Total cost should be approximately \$20.5 million over the project's life.

The UPRM cost estimates presented here account for only *core* functionality, or approximately 80% of the total system functionality. Given the total costs associated with ONGARD®, core functionality should probably cost approximately 80% of \$20 million or \$16.4 million.

The UPRM cost estimate of \$16.7 million is within 2% of the ONGARD® estimate for core functionality, verifying the order-of-magnitude estimates prepared by the UPRM project team.

Note that the comparisons made to the ONGARD® costs were performed by the UPRM project team. These cost estimates were not audited or externally verified, although they are believed to be accurate and reliable.

ATTACHMENT B1(1)

Assumed Project Work Plan

UPRM Implementation Requirements

Assumed Project Work Plan

ATTACHMENT B1(2)

Assumed Process Inventory

UPRM Implementation Requirements

Assumed Process Inventory

Screens	Batch Jobs	Reports	Batch Processes
---------	---------------	---------	--------------------

Summary				
Assume the following distribution of program complexity:				
Easy.....15%	11	13	9	14
Medium.....70%	51	62	43	65
Difficult.....15%	11	13	9	14
	73	88	61	93

Allowables

Screens

Main Menu
Report Initiation
Batch Job Initiation
Maintain Allowables

1			
1			
1			
1			

Reports

Report Statistics
Report Batch Statistics
Generate Schedules
Notify over/underages

	1	1	
	1	1	
	1	1	
	2	2	

Batch Processes

Calculate Allowables
Adjust Balances

	1		4
	1		5

<i>Subtotal.....</i>	4	7	5	9
----------------------	---	---	---	---

UPRM Implementation Requirements

Assumed Process Inventory

Screens	Batch Jobs	Reports	Batch Processes
---------	---------------	---------	--------------------

Data Capture & Validation

Screens

Main Menu	1			
Report Initiation	1			
Batch Job Initiation	1			
Capture: Well Test	1			
Capture: Conservation Vols	1			
Capture: Tax Volumes & Values	1			
Capture: Royalty Vols & Vals	1			

Reports

Report Statistics		1	1	
Report Batch Statistics		1	1	
Error Summary - 1		1	1	
Error Summary - 2		1	1	
Error Summary - 3		1	1	
Transaction Summary - 1		1	1	
Transaction Summary - 2		1	1	
Transaction Summary - 3		1	1	

Batch Processes

EDI Receive: Financial		1		3
EDI Receive: Well Test		1		3
EDI Receive: Conservation Vols		1		3
EDI Receive: Tax Vols & Vals		1		3
EDI Receive: Royalty Vols & Vals		1		3

Tape Receive: Financial		1		3
Tape Receive: Well Test		1		3
Tape Receive: Conservation Vols		1		3
Tape Receive: Tax Vols & Vals		1		3
Tape Receive: Royalty Vols & Vals		1		3

Disk Receive: Financial		1		3
Disk Receive: Well Test		1		3
Disk Receive: Conservation Vols		1		3
Disk Receive: Tax Vols & Vals		1		3
Disk Receive: Royalty Vols & Vals		1		3

UPRM Implementation Requirements

Assumed Process Inventory

	Screens	Batch Jobs	Reports	Batch Processes
Validate: Financial		1		3
Validate: Well Test		1		3
Validate: Conservation Vols		1		3
Validate: Tax Vols & Vals		1		3
Validate: Royalty Vols & Vals		1		3
<i>Subtotal.....</i>	7	.28	8	60

UPRM Implementation Requirements

Assumed Process Inventory

Screens	Batch Jobs	Reports	Batch Processes
---------	---------------	---------	--------------------

External Data Sharing

Screens

(Assume external users use existing screens with user and field-specific security.)

Main Menu	1			
Report Initiation	1			
Batch Job Initiation	1			

Reports

Report Statistics		1	1	
Report Batch Statistics		1	1	

(Assume 2 versions of each major volume/value report)

Well Test - 1		1	1	
Well Test - 2		1	1	
Allowables - 1		1	1	
Allowables - 2		1	1	
Conservation - 1		1	1	
Conservation - 2		1	1	
Tax - 1		1	1	
Tax - 2		1	1	
Royalty - 1		1	1	
Royalty - 2		1	1	

Well Completion		1	1	
Well Bore		1	1	
Unit		1	1	
State Lease		1	1	
Business Associate		1	1	
Tax Group		1	1	

Well Completion -to- Well Bore		1	1	
Well Completion -to- Unit		1	1	
Well Completion -to- Tax Group		1	1	
Well Completion -to- State Lease		1	1	

Remitter -to- State Lease		1	1	
Remitter -to- Tax Group		1	1	

UPRM Implementation Requirements

Assumed Process Inventory

Screens	Batch Jobs	Reports	Batch Processes
---------	---------------	---------	--------------------

Batch Processes

EDI Send	1		3
Tape Send	1		3
Disk Send	1		3
CD-ROM Send	1		3

<i>Subtotal....</i>	3	28	24	12
---------------------	---	----	----	----

Permitting

Screens

Main Menu	1			
Report Initiation	1			
Batch Job Initiation	1			
Maintain Applications (Drill, Complete, Abandon)	3			

Reports

Report Statistics	1	1	
Report Batch Statistics	1	1	

Permit	1	1	
--------	---	---	--

Batch Processes

(None)			
--------	--	--	--

<i>Subtotal....</i>	6	3	3	0
---------------------	---	---	---	---

UPRM Implementation Requirements

Assumed Process Inventory

Screens	Batch Jobs	Reports	Batch Processes
---------	---------------	---------	--------------------

Registration & Relationship Maintenance

Screens

Main Menu	1			
Report Initiation	1			
Batch Job Initiation	1			
Maintain Business Associate	1			
Maintain State Lease	1			
Maintain Tax Group	1			
Maintain Tax Exemptions	1			
Maintain Well Bore	1			
Maintain Well Completion	1			
Maintain Unit	1			
Well Completion -to- Well Bore	1			
Well Completion -to- Unit	1			
Well Completion -to- Tax Group	1			
Well Completion -to- State Lease	1			

Reports

Report Statistics		1	1	
Report Batch Statistics		1	1	

Batch Processes

(None)				
--------	--	--	--	--

Subtotal....	14	2	2	0
---------------------	-----------	----------	----------	----------

Unitization

Screens

Main Menu	1			
Report Initiation	1			
Batch Job Initiation	1			

Reports

Unit Agreement		1	1	
----------------	--	---	---	--

Batch Processes

(None)				
--------	--	--	--	--

Subtotal....	3	1	1	0
---------------------	----------	----------	----------	----------

UPRM Implementation Requirements

Assumed Process Inventory

Screens	Batch Jobs	Reports	Batch Processes
---------	---------------	---------	--------------------

Volume Analysis

Screens

Main Menu	1			
Report Initiation	1			
Batch Job Initiation	1			

Reports

Report Statistics		1	1	
Report Batch Statistics		1	1	

Conservation/Royalty Discrepancies		1	1	
Conservation/Tax Discrepancies		1	1	
Tax/Royalty Discrepancies		1	1	

Batch Processes

Conservation/Royalty Discrepancies		1		3
Conservation/Tax Discrepancies		1		3
Tax/Royalty Discrepancies		1		3

<i>Subtotal....</i>	3	8	5	9
---------------------	---	---	---	---

Value Analysis

Screens

Main Menu	1			
Report Initiation	1			
Batch Job Initiation	1			

Reports

Report Statistics		1	1	
Report Batch Statistics		1	1	

Tax/Royalty Discrepancies		1	1	
---------------------------	--	---	---	--

Batch Processes

Tax/Royalty Discrepancies		1		3
---------------------------	--	---	--	---

<i>Subtotal....</i>	3	4	3	3
---------------------	---	---	---	---

UPRM Implementation Requirements

Assumed Process Inventory

Screens	Batch Jobs	Reports	Batch Processes
---------	---------------	---------	--------------------

OVERALL ARCHITECTURE COMPONENTS

Screens

Main Menu	1			
Help Maintenance	5			
Help Display	5			
Codes File Maintenance	5			
Security Maintenance	5			
Miscellaneous	9			

Reports

Help Text		2	2	
Codes File		2	2	
Security Codes		1	1	
Miscellaneous		2	5	

Batch Processes

(None)				
--------	--	--	--	--

Subtotal....	30	7	10	0
---------------------	-----------	----------	-----------	----------

ATTACHMENT B1(3)

Cost Approximation Detail

UPRM Implementation Requirements

Cost Approximation Detail

Step 1 Approximate Total Work-Days Required for Development of Core Functions

1	2	3	4	5	6	7	8	9	10	11
GUIDELINES, Work-Days				CORE COMPLEXITY			CORE APPROXIMATION, Work-Days			
Easy	Med	Diff		Easy	Med	Diff	Easy	Med	Diff	TOTAL
Systems Analysis and Design										
Project Overhead (Always = 1)	200	600	1,200	0	1	0	0	600	0	600
# of Automated Applications	150	225	300	1	7	1	150	1,575	300	2,025
# of Batch Jobs	5	8	10	13	62	13	65	465	130	660
# of Reports	2	3	4	9	43	9	18	129	36	183
# of Screens	5	8	10	11	51	11	55	383	110	548
Total Work-Days - Design.....										4,016
Systems Installation										
# of Automated Applications	250	375	500	1	7	1	250	2,625	500	3,375
# of Batch modules	25	35	45	14	65	14	350	2,275	630	3,255
# of Reports	15	30	45	9	43	9	135	1,290	405	1,830
# of Screens	25	38	50	11	51	11	275	1,913	550	2,738
# of Satellite Sites	125	250	375	0	1	0	0	250	0	250
Total Work-Days - Installation.....										11,448
TOTAL WORK-DAYS.....										15,463

UPRM Implementation Requirements

Cost Approximation Detail

STEP 1: Notes on Specific Column Numbers

- 1 Contains the factors used as input to the estimating methodology.
- 2,3,4 Contain the METHOD/1 estimating guidelines for the factors contained in Column 1.
Note that these guidelines are provided for factors at three levels of difficulty: Easy, Medium, and Difficult.
- 5,6,7 Contain the actual quantified estimates of the factors for the UPRM Uniformity Guidelines.
Note that these estimates are provided for the three levels of difficulty listed in Columns 2,3,4.
- 8,9,10 Contain the approximated level of effort required for implementing UPRM guidelines.
Calculated as follows:
Column 8 = Column 2 * Column 5
Column 9 = Column 3 * Column 6
Column 10 = Column 4 * Column 7
- 11 Contains the total requirements for the specified factor (Column 1).
Calculated as the sum of Columns 8,9,10.

UPRM Implementation Requirements

Cost Approximation Detail

Step 2. Approximate Work-Days Required to Interface to Existing Syst

Development of Core Functionality

Analysis and Design.....

Installation.....

Base Estimates	Assume 20% of Base	Total
4,016	803	4,819
11,448	2,290	13,737
15,463	3,093	18,556

UPRM Implementation Requirements

Cost Approximation Detail

Step 3. Approximate Labor Costs

	Work-Days	
<i>Development of Core Functionality</i>		
Analysis and Design.....	4,016	
Implementation.....	11,448	15,463
<i>Interface to Non-Core Functionality</i>		
20% of Core.....	3,093	3,093
		18,556
Assume:		
20% of Labor is State Employed.....	20%	3,711
80% of Labor is Externally-Supplied.....	80%	14,844
		18,556
Assume:		
State Labor Costs: \$/Day.....	\$250	928 Thousands of Dollars
External Labor Costs: \$/Day.....	\$1,000	14,844 Thousands of Dollars
	\$	15,772 Thousands of Dollars
TOTAL LABOR COSTS.....	\$	15,772 THOUSANDS OF DOLLARS

UPRM Implementation Requirements

Cost Approximation Detail

Demonstrate Sensitivity to Labor Cost Rates

Estimated State Labor (Work-Days).....	3,711
Estimated External Labor (Work-Days).....	14,844
	<u>18,556</u>

		<i>External Labor Cost, \$/Day</i>		
		\$850	\$1,000	\$1,150
<i>State Labor</i>	\$200	\$13,360,032	\$15,586,704	\$17,813,376
<i>Cost</i>	\$250	\$13,545,588	\$15,772,260	\$17,998,932
<i>\$/Day</i>	\$300	\$13,731,144	\$15,957,816	\$18,184,488

Appendix C

Uniform Production Reporting Model

State Characteristics & Uniformity Guideline Weights

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C. STATE CHARACTERISTICS & UNIFORMITY GUIDELINE
WEIGHTS

D. QUESTIONNAIRE

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F. PI GRID CODE ASSIGNMENT

Appendix C

Section 1

State Characteristics & Uniformity Guideline Weights

Inventory of State Characteristics

INVENTORY OF STATE CHARACTERISTICS

Introduction

In order to gain a better understanding of the variations in demands placed on gas and oil processing systems, comparative statistics on state characteristics were collected and recorded for all gas and oil producing states and for the Minerals Management Service (MMS). Various publications were reviewed including EIA monthly and annual reports, the IOGCC Summary of State Statutes, and API publications. This information was compiled and entered into tables for review purposes. Information recorded for Kansas, Louisiana, New Mexico, Ohio, Oklahoma, Texas, Wyoming, and MMS was reviewed and discussed with state and federal agency representatives. Corrections and comments received during the review process were included in the listing of characteristics presented in the following section.

DESCRIPTION	KANSAS		COMMENTS
	OIL	GAS	
# transx points/meters	31,991	18,772	± Estimate by DOR
# meter operators	N/A	N/A	
# transporter/gatherers	45	305	Only if they report
# of operators	approx. 3350		
Est. # producing wells	51,000	17,500	
Est. # non-producing and abandoned	± 10,000	3,000	Includes T.A. & shut-in due to price
Prod/sales volumes in 1991	57 MMbbl	635 Bcf	1991 oil=561,654,000; gas=635,223,000
in 1992	53 MMbbl	644 Bcf	Subject to D.O.R. updates and revisions (EIA)
Reserve volumes 12/91	300 MMbbl	9358 Bcf	
12/92 (Est.)	299 MMbbl	8900 Bcf	
Natural gas consumption	N/A		
# federal leases			Unknown
# federal acres			Unknown
WHO REPORTS? conservation data	operator/ purchaser	meter operator	In prorated fields
to	Corp Comm, Cons Div 316 263-323		
level	lease/well code	lease/well code/lease code	
Reporting frequency	monthly	monthly	
Reporting time lag	30 days	30 days	
is comprehensive?	no	no	
is computerized?	yes	yes	
Hardware	IBM mainframe WSU, PC's As-400 Minicomputer and LAN system		
Software	Oil/Gas Proration Prog. Well Master File Tracking		
Age of system	1990		
WHO REPORTS? tax data	first purchaser	1st purch/ oper	
to	Dept of Revenue, Min Tax		
level	lease/well code		
Reporting frequency	monthly	monthly	
Reporting time lag	30 days	30 days	
# of remitters	45	305	
# of tax groups	32,279	18,893	
Oil and gas revenues	\$29,829,055	\$55,731,685	Calendar year 1992
is computerized?	yes	yes	
Hardware	Amdahl 5890 mainframe		
Software	ADABAS		
Age of system	1989		

DESCRIPTION	KANSAS		COMMENTS
	OIL	GAS	
Who reports ? royalty data	N/A		
to			
from			
Reporting frequency			
Reporting time lag			
# of remitters			
Oil and gas revenues			
FY 91/92 Mineral royalties and bonuses	N/A		
FY 91/92 Permanent fund balance	N/A		
State lands - # mineral acres managed	N/A		
# state leases			
is computerized?			
Hardware			
Software			
Age of system			

DESCRIPTION	LOUISIANA		COMMENTS
	OIL	GAS	
# transx points/meters	7636	11240	
# meter operators	1250	1015	
# transporter/gatherers	400		
# of operators	1250	1015	
Est. # producing wells	22730	13156	
Est. # non-producing and abandoned	45583	13156	+ 87,276 wells with no product code
Prod/sales volumes in 1991	113 MMbbl	1527 Bcf	
in 1992	135 MMbbl	1620 Bcf	
Reserve volumes 12/91	679 MMbbl	10,912 Bcf	
12/92			Dept of Interior publishes but we do not have figures
Natural gas consumption	9,213,549,991 bbls		
# federal leases			
# federal acres			
WHO REPORTS? conservation data	operator	operator	
to	Office of Cons 504 342-5540		
level	lease/unit	well #/unit	
Reporting frequency	monthly	monthly	
Reporting time lag	45 days	45 days	
is comprehensive?	no	no	
is computerized?	yes	yes	
Hardware			
Software			
Age of system			
WHO REPORTS? tax data	producer/ purchaser	producer/ purchaser	
to	Dept. Rev & Tax, STS		
level	lease	lease	
Reporting frequency			
Reporting time lag			
# of remitters			
# of tax groups			
Oil and gas revenues			
is computerized?	yes	yes	
Hardware			
Software			
Age of system			
WHO REPORTS? royalty data	lessee	lessee	

DESCRIPTION	LOUISIANA		COMMENTS
	OIL	GAS	
to	State Land Office		
level	lease/unit	lease/unit	
Reporting frequency			
Reporting time lag			
# of remitters			
Oil and gas revenues			
FY 91/92 Mineral royalties and bonuses	\$188,960,000		
FY 91/92 Permanent fund balance	\$0		
State lands - # mineral acres managed	500,000		
# state leases			
is computerized?	yes	yes	
Hardware			
Software			
Age of system			

DESCRIPTION	NEW MEXICO		COMMENTS
	OIL	GAS	
# transx points/meters			
# meter operators			
# transporter/gatherers			
# of operators			
Est. # producing wells	22600	20000	
Est. # non-producing and abandoned			
Prod/sales volumes in 1991	65 MMbbl	1013 Bcf	
in 1992			
Reserve volumes 12/91	721 MMbbl	18,539 Bcf	
12/92			
Natural gas consumption			
# federal leases			
# federal acres			
WHO REPORTS? conservation data	operator/producer		
to	Energy, Min & Nat Res, Oil Con Div 505 827-5800		
level	completion	completion	
Reporting frequency	monthly	monthly	
Reporting time lag	55 days	55 days	
is comprehensive?	no	no	
is computerized?	yes	yes	
Hardware	IBM ES 9000 mainframe		
Software	ONGARD		
Age of system	phased in by 12/94		
WHO REPORTS? tax data	operator/producer		
to	D of Tax & Rev, O&G Div		
level	PJN		
Reporting frequency	monthly	monthly	
Reporting time lag	55 days	55 days	
# of remitters			
# of tax groups			
Oil and gas revenues			
is computerized?	yes	yes	
Hardware	IBM ES 9000 mainframe		
Software	ONGARD		
Age of system	phased in 12/94		
WHO REPORTS? royalty data	operator	operator	

C1-5

DESCRIPTION	NEW MEXICO		COMMENTS
	OIL	GAS	
to	State Land Office		
level	PUN/lease	PUN/lease	
Reporting frequency			
Reporting time lag			
# of remitters			
Oil and gas revenues			
FY 91/92 Mineral royalties and bonuses	\$134,795,665		
FY 91/92 Permanent fund balance	\$3,060,144,797		
State lands - # mineral acres managed	13,400,000		
# state leases			
is computerized?			
Hardware			
Software			
Age of system			

DESCRIPTION	OHIO		COMMENTS
	OIL	GAS	
# transx points/meters		33,000	
# meter operators		1500 +	
# transporter/gatherers	200		
# of operators	2090		
Est. # producing wells	65695		
Est. # non-producing and abandoned	6000 +		
Prod/sales volumes in 1991	9 MMbbl	132 Bcf	
in 1992			
Reserve volumes 12/91	66 MMbbl	766 Bcf	
12/92	N/A	N/A	
Natural gas consumption			N/A for 1992
# federal leases			BLM report due 12/9/93
# federal acres			
WHO REPORTS? conservation data	operator	operator	
to	Dept. Nat Res, Div of Oil and Gas 614 265-6917 307 234-7147		
level	completion well bore	completion well bore	
Reporting frequency	annually	annually	
Reporting time lag	100 days	100 days	April 15th filing for previous year's production
is comprehensive?	no	no	
is computerized?	yes	yes	
Hardware	DEC VAX 8200		
Software	Oil and Gas Permitting System, Surety Owners Database		
Age of system	1991		
WHO REPORTS? tax data			
to	Dept of Taxation		
level	tax return	tax return	
Reporting frequency	quarterly/ yearly	quarterly/ yearly	Annual if less than \$100 per year
Reporting time lag			
# of remitters	1400		
# of tax groups	1		
Oil and gas revenues	FY 92 \$8.6 million		
is computerized?	yes	yes	
Hardware	IBM PC's		
Software	Severance Tax Masterfile		
Age of system	7/87		

C1-7

DESCRIPTION	OHIO		COMMENTS
	OIL	GAS	
WHO REPORTS? royalty data	N/A	N/A	Dept of Adm. Serv. executes leases, each state agency collects royalties. No common reporting.
to			
level			
Reporting frequency			
Reporting time lag			
# of remitters			
Oil and gas revenues			
FY 91/92 Mineral royalties and bonuses			
FY 91/92 Permanent fund balance			
State lands - # mineral acres managed			
# state leases			
is computerized?			
Hardware			
Software			
Age of System			

DESCRIPTION	OKLAHOMA		COMMENTS
	OIL	GAS	
# transx points/meters			Unable to obtain data
# meter operators	≈ 750	≈ 200	
# transporter/gatherers	≈ 700		
# of operators	3460		3460 surety records, ≈ 7000 from tax records
Est. # producing wells	100,000	28,000	
Est. # non-producing and abandoned	75,000		GIS records indicate 400,000 total wells ever drilled
Prod/sales volumes in 1991	92 MMbbl	1983 Bcf	
in 1992	102 MMbbl	1963 Bcf	
Reserve volumes 12/91	700 MMbbl	14,725 Bcf	
12/92	700 MMbbl	14,732 Bcf	
Natural gas consumption	N/A		
# federal leases	N/A		
# federal acres	N/A		
WHO REPORTS? conservation data	purchaser/ transporter	meter operator	
to	OCC, Div Oil & Gas 405 521-2301		
level	lease	CDP/meter	
Reporting frequency	monthly	monthly	
Reporting time lag	30 days	30 days	
is comprehensive?	no	no	
is computerized?	yes	yes	
Hardware			
Software	O&G Oper/Pur/Plug Master Intent to Drill (ITD), Well Inv.(WDHS), G/O Allow Prod Master (G/O AP), Case Proc. Syst.		
Age of system	mid 1980's		
WHO REPORTS? tax data	tax remitter/transporter		
to	Gross Prod Div, OTC		
level	PUN or tax group		
Reporting frequency	monthly	monthly	
Reporting time lag	40 days	45 days	
# of remitters	675		
# of tax groups	88,000 active		135,000 total
Oil and gas revenues	\$380,937,348		
is computerized?	yes	yes	
Hardware	IBM 3090 model 300		
Software	CICS 3.4, COBOL 2		
Age of system	12 years		

C1-9

DESCRIPTION	OKLAHOMA		COMMENTS
	OIL	GAS	
WHO REPORTS? royalty data	lessee		
to	State Land Office		
level	well/lease	well/lease	
Reporting frequency	monthly	monthly	
Reporting time lag	30 days	30 days	
# of remitters	600		
Oil and gas revenues	\$15 Million		
FY 91/92 Mineral royalties and bonuses	\$15,989,165		
FY 91/92 Permanent fund balance	\$648,611,809		
State lands - # mineral acres managed	1,026,000		
# state leases	3829		
is computerized?	yes	yes	
Hardware	VAX by Dec. 1993		
Software			
Age of system	1986		

DESCRIPTION	TEXAS		COMMENTS
	OIL	GAS	
# transx points/meters	64,622	47,230	Oil leases and gas wells 8/93
# meter operators	9503	4619	
# transporter/gatherers	1547		
# of operators	9503	4619	
Est. # producing wells	191000	48000	
Est. # non-producing and abandoned	70,000	10,000	
Prod/sales volumes in 1991	646 MMbbl	5521 Bcf	
in 1992	613 MMbbl	5450 Bcf	
Reserve volumes 12/91	6797 MMbbl	36174 Bcf	
12/92	6441 MMbbl	35093 Bcf	DOE - EIA
Natural gas consumption	3584 Bcf		1991. DOE - EIA
# federal leases			
# federal acres			
WHO REPORTS? conservation data	operator/ transporter	operator/ transporter	
to	Texas RR Comm 512 463-6887		
level	lease	meter	
Reporting frequency	monthly	monthly	
Reporting time lag	30 days	30 days	
is comprehensive?	no	no	
is computerized?	yes	yes	
Hardware	Amdahl 5890 200		
Software	MV ESA, IMS		
Age of system	≈ 6 years old		
WHO REPORTS? tax data	purchaser/ producer	purchaser/ producer	
to	State Compt. of Pub Acct		
level	county	lease	
Reporting frequency			
Reporting time lag			
# of remitters			
# of tax groups			
Oil and gas revenues			
is computerized?			
Hardware			
Software			
Age of system			
WHO REPORTS? royalty data	lessee	lessee	

C1-11

DESCRIPTION	TEXAS		COMMENTS
	OIL	GAS	
to	General Land Office		
level	unit/lease	unit/lease	
Reporting frequency	monthly	monthly	
Reporting time lag	35 days	45 days	oil - 5th of second mo. / gas - 15th of second mo.
# of remitters	800	800	
Oil and gas revenues			
FY 91/92 Mineral royalties and bonuses	\$172,333,286		
FY 91/92 Permanent fund balance	\$7,579,397,350		
State lands - # mineral acres managed	12,515,080		
# state leases	3100 active		
is computerized?	yes	yes	
Hardware	Unisys sys 80, mod. 20		Royalty systems being moved to UNIX and LAN systems
Software	TIP 30, OS3		Will use INGRES for some apps., undecided about rest
Age of system	1985		

DESCRIPTION	WYOMING		COMMENTS
	OIL	GAS	
# transx points/meters			No tabulation or summary available
# meter operators			No tabulation or summary available
# transporter/gatherers			No tabulation or summary available
# of operators	993		
Est. # producing wells	11,288	3111	
Est. # non-producing and abandoned	137,000		
Prod/sales volumes in in 1991	99.8 MMbbl /111 MMbbl	960 Bcf/ 955 Bcf	
in 1992	97 MMbbl/ 97.8 MMbbl	1012 Bcf/ 815 Bcf	
Reserve volumes 12/91	757 MMbbl	9941 Bcf	Plus 748 HBbls of NGL's
12/92	660 MMbbl	8929 Bcf	Plus approx. 700 HBbls NGL's
Natural gas consumption	45.7 Bcf		Not reported to OGCC
# federal leases	21,482		Reported by BLM: oil and gas leases
# federal acres	13,359,593		Reported by BLM: acres under leases
WHO REPORTS? conservation data	operator	operator	
to	Wyo OGCC 307 234-7147		
level	completion	completion	
Reporting frequency	monthly	monthly	
Reporting time lag	30 days	30 days	
is comprehensive?	no	no	
is computerized?	yes	yes	
Hardware	IBM 3090 mainframe, PC's		
Software	Master Well Inv File, Oil & Gas Master Prod File, Underground Inj. Cont Prog File		
Age of system	1978		
WHO REPORTS? tax data	operators/ int owners	operators/ int owners	
to	Wyo Dept. Revenue		
level	tax group	tax group	
Reporting frequency	monthly/ yearly	monthly/ yearly	
Reporting time lag	varies	varies	
# of remitters	723		
# of tax groups			
Oil and gas revenues	\$72,866,969	\$57,714,523	
is computerized?	yes	yes	
Hardware	IBM 3090 mainframe, PC's		

C1-13

DESCRIPTION	WYOMING		COMMENTS
	OIL	GAS	
Software	DOR Info syst. (DORIS) Centralized Taxpayer Reg. Sys (CTRS)		
Age of system	Oct. 1993		
WHO REPORTS? royalty data	lessee/ operator	lessee/ operator	Report supported by hardcopy from purchasers
to	State Land & Farming Office		
level	sales volumes		
Reporting frequency	monthly	monthly	
Reporting time lag	30 days	30 days	
# of remitters	300		
Oil and gas revenues	\$16+MM		
FY 91/92 Mineral royalties and bonuses	\$40,320,000		
FY 91/92 Permanent fund balance	\$758,000,000		
State lands - # mineral acres managed	4,237,000		
# state leases	680 Op.		
is computerized?	yes	yes	
Hardware	Compaq Deskpro 486		
Software	State Lands Leasing Sys (SLL) Roy Acct Sys (RAS)		Dbase
Age of System	1/89 RAS, 10/93 SLL		

DESCRIPTION	MMS OFFSHORE		COMMENTS
	OIL	GAS	
# transx points/meters			
# meter operators			
# transporter/gatherers			
# of operators			
Est. # producing wells			
Est. # non-producing and abandoned			
Prod/sales volumes in 1991	284 MMbbl	4674 Bcf	
in 1992			
Reserve volumes 12/91	2620 MMbbl	29448 Bcf	
12/92			
Natural gas consumption			
# federal leases			
# federal acres			
WHO REPORTS? conservation data	purchaser	oper/work int owner	
to	Director, MMS Royalty Mgmt. Program		
level	completion	completion	
Reporting frequency	monthly	monthly	
Reporting time lag	45 days	45 days	
is comprehensive?	yes	yes	
is computerized?-	yes	yes	
Hardware			
Software	Prod Acct & Aud Sys (PAAS) Mo Rept Oper (MRO)		
Age of system			
WHO REPORTS? tax data			
to			
level			
Reporting frequency			
Reporting time lag			
# of remitters			
# of tax groups			
Oil and gas revenues			
is computerized?			
Hardware			
Software			
Age of system			

01-16

DESCRIPTION	MMS OFFSHORE		COMMENTS
	OIL	GAS	
WHO REPORTS? royalty data	varies	varies	
to	Royalty Mgmt Program		
level	royalty point		
Reporting frequency	monthly	monthly	
Reporting time lag	45 days	45 days	
# of remitters			
Oil and gas revenues			
FY 91/92 Mineral royalties and bonuses			
FY 91/92 Permanent fund balance			
State lands - # mineral acres managed			
# state leases			
is computerized?	yes	yes	
Hardware	PC based		
Software	Roy Aud & Acct Sys (RATS) Aud and Fin Sys (AFS)		
Age of System			

DESCRIPTION	MMS ONSHORE		COMMENTS
	OIL	GAS	
# transx points/meters			
# meter operators			
# transporter/gatherers			
# of operators			
Est. # producing wells			
Est. # non-producing and abandoned			
Prod/sales volumes in 1991			
in 1992			
Reserve volumes 12/91			
12/92			
Natural gas consumption			
# federal leases			
# federal acres			
WHO REPORTS? conservation data	purchaser	oper/work int owner	
to	Director, MMS Royalty Mgmt. Program		
level	completion	completion	
Reporting frequency	monthly	monthly	
Reporting time lag	45 days	45 days	
is comprehensive?	yes	yes	
is computerized?	yes	yes	
Hardware			
Software	Aud & Fin Sys (AFS) Prod Acct & Aud Sys (PAAS) Mo Rept Oper (MRO)		
Age of system			
WHO REPORTS? tax data			
to			
level			
Reporting frequency			
Reporting time lag			
# of remitters			
# of tax groups			
Oil and gas revenues			
is computerized?			
Hardware			
Software			
Age of system			

C1-18

DESCRIPTION	MMS ONSHORE		COMMENTS
	OIL	GAS	
WHO REPORTS? royalty data	varies	varies	
to	Royalty Mgmt Program		
level	royalty point		
Reporting frequency	monthly	monthly	
Reporting time lag	30 days	30 days	
# of remitters			
Oil and gas revenues			
FY 91/92 Mineral royalties and bonuses			
FY 91/92 Permanent fund balance			
State lands - # mineral acres managed			
# state leases			
is computerized?	yes	yes	
Hardware	PC based		
Software	Roy Aud & Acct Sys (RATS)		
Age of System			

DESCRIPTION	ALABAMA		ALASKA		CALIFORNIA	
	OIL	GAS	OIL	GAS	OIL	GAS
# transx points/ meters						
# meter operators						
# transporter/ gatherers						
# of operators	112		5			
Est. # producing wells	850	3400	1600	100		
Est. # non-producing and abandoned						
Prod/sales volumes in 1991	9 MMbbl	146 Bcf	656 MMbbl	353 Bcf	317 MMbbl	308 Bcf
in 1992						
Reserve volumes 12/91						
12/92						
Natural gas consumption						
# federal leases						
# federal acres						
WHO REPORTS? conservation data						
to	Al Oil & Gas Board 205 349-2852		Ak OGCC 907 276-7542		Dept of Cons, Div Oil & Gas 916 445-9686	
level	well	well	well	meter	well	meter
Reporting frequency	monthly	monthly	monthly	monthly	monthly	monthly
Reporting time lag	30 days	30 days	30 days	30 days	30 days	30 days
is comprehensive?						
is computerized?						
Hardware						
Software						
Age of system						
WHO REPORTS? tax data						
to	Al Dept of Revenue		Ak Dept of Revenue		Controller, Tax Sect	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
# of tax groups						
Oil and gas revenues						
is computerized?						

DESCRIPTION	ALABAMA		ALASKA		CALIFORNIA	
	OIL	GAS	OIL	GAS	OIL	GAS
Hardware						
Software						
Age of system						
WHO REPORTS? royalty data						
to			Dept of Nat Resources		State Lands Comm	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
Oil and gas revenues						
FY 91/92 Mineral royalties and bonuses			\$1,311,817,544		\$320,000	
FY 91/92 Permanent fund balance			\$13,373,000,000		0	
State lands - # mineral acres managed			85,983,000		760,696	
# state leases						
Is computerized?						
Hardware						
Software						
Age of System						

C1-21

DESCRIPTION	COLORADO		FLORIDA		IDAHO	
	OIL	GAS	OIL	GAS	OIL	GAS
# transx points/ meters						
# meter operators						
# transporter/ gatherers						
# of operators	668		11			
Est. # producing wells	5800	6000				
Est. # non-producing and abandoned						
Prod/sales volumes in 1991	29 MMbbl	282 Bcf	4 MMbbl	4 Bcf		
in 1992						
Reserve volumes 12/91						
12/92						
Natural gas consumption						
# federal leases						
# federal acres						
WHO REPORTS? conservation data						
to	Co OGCC 303 894-2100		Dept Nat Res, Mgt Div 904 488-4191		Id IOGCC, Dept of Lands 208-664-2171	
level	lease	meter	meter	meter	meter	meter
Reporting frequency	monthly	monthly	monthly	monthly	varies	varies
Reporting time lag	45 days+	45 days+	55 days	55 days		
is comprehensive?						
is computerized?						
Hardware						
Software						
Age of system						
WHO REPORTS? tax data						
to	Co Dept of Revenue		Fla Dept of Revenue		Id Tax Comm	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
# of tax groups						
Oil and gas revenues						
is computerized?						

DESCRIPTION	COLORADO		FLORIDA		IDAHO	
	OIL	GAS	OIL	GAS	OIL	GAS
Hardware						
Software						
Age of system						
WHO REPORTS? royalty data						
to	Board of Land Comm					
level						
Reporting frequency						
Reporting time lag						
# of remitters						
Oil and gas revenues						
FY 91/92 Mineral royalties and bonuses	\$8,264,440		\$1,311,817,544		\$320,000	
FY 91/92 Permanent fund balance	\$208,400,000		\$13,373,000,000		0	
State lands - # mineral acres managed	14,038,593		85,983,000		760,696	
# state leases						
is computerized?						
Hardware						
Software						
Age of System						

DESCRIPTION	ILLINOIS		INDIANA		KENTUCKY	
	OIL	GAS	OIL	GAS	OIL	GAS
# transx points/ meters						
# meter operators						
# transporter/ gatherers						
# of operators	679		277		393	
Est. # producing wells			10,000	600	23,000	12,300
Est. # non-producing and abandoned						
Prod/sales volumes in 1991	16 MMbbl				4 MMbbl	78 Bcf
in 1992						
Reserve volumes 12/91						
12/92						
Natural gas consumption						
# federal leases						
# federal acres						
WHO REPORTS? conservation data						
to	Dept Mines & Min, Oil & Gas Div 217 782-7756		Div of Oil & Gas 317 232-4055		Div Oil & Gas Cons 606 254-0367	
level						
Reporting frequency					yearly	yearly
Reporting time lag					2-12 mo	2-12 mo
is comprehensive?						
is computerized?						
Hardware						
Software						
Age of system						
WHO REPORTS? tax data	no tax	no tax				
to			Special Tax Div, DOG		Revenue Cabinet	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
# of tax groups						
Oil and gas revenues						
is computerized?						

C1-24

DESCRIPTION	ILLINOIS		INDIANA		KENTUCKY	
	OIL	GAS	OIL	GAS	OIL	GAS
Hardware						
Software						
Age of system						
WHO REPORTS? royalty data						
to						
level						
Reporting frequency						
Reporting time lag						
# of remitters						
Oil and gas revenues						
FY 91/92 Mineral royalties and bonuses						
FY 91/92 Permanent fund balance						
State lands - # mineral acres managed						
# state leases						
is computerized?						
Hardware						
Software						
Age of System						

DESCRIPTION	MISSISSIPPI		MISSOURI		MONTANA	
	OIL	GAS	OIL	GAS	OIL	GAS
# transx points/ meters						
# meter operators						
# transporter/ gatherers						
# of operators	300		24		292	
Est. # producing wells	1982	529	661	6	4514	2500
Est. # non-producing and abandoned						
Prod/sales volumes in 1991	25 MMbbl	143 Bcf			19 MMbbl	48 Bcf
in 1992						
Reserve volumes 12/91						
12/92						
Natural gas consumption						
# federal leases						
# federal acres						
WHO REPORTS? conservation data						
to	Oil & Gas Board 601 354-7114		State Oil & Gas Council 314 364-1752		Board of Oil & Gas Cons 406 449-2622	
level	well	well	lease	lease	well	well
Reporting frequency	monthly	monthly	monthly	monthly	monthly	monthly
Reporting time lag	30 days	30 days	30 days	30 days	60 days	60 days
is comprehensive?						
is computerized?						
Hardware						
Software						
Age of system						
WHO REPORTS? tax data			no tax	no tax		
to	Severance Tax Div				Dept of Rev, Nat Res Div	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
# of tax groups						
Oil and gas revenues						
is computerized?						

C1-26

DESCRIPTION	MISSISSIPPI		MISSOURI		MONTANA	
	OIL	GAS	OIL	GAS	OIL	GAS
Hardware						
Software						
Age of system						
WHO REPORTS? royalty data						
to					Mont Dept of State Lands	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
Oil and gas revenues						
FY 91/92 Mineral royalties and bonuses					\$5,767,624	
FY 91/92 Permanent fund balance					\$247,924,155	
State lands - # mineral acres managed					6,196,634	
# state leases						
is computerized?						
Hardware						
Software						
Age of System						

DESCRIPTION	NEBRASKA		NEW YORK		NORTH DAKOTA	
	OIL	GAS	OIL	GAS	OIL	GAS
# transx points/ meters						
# meter operators						
# transporter/ gatherers						
# of operators	183		695		234	
Est. # producing wells	1716	12			4250	104
Est. # non-producing and abandoned						
Prod/sales volumes in 1991	5 MMbbl			19 Bcf	33 MMbbl	49 Bcf
in 1992						
Reserve volumes 12/91						
12/92						
Natural gas consumption						
# federal leases						
# federal acres						
WHO REPORTS? conservation data						
to	Neb OGCC 308 254-4595		Dept Env Cons, Min Div 518 457-7480		ND Ind Comm, Oil & Gas Div 701 224-2969	
level	lease	lease	lease	meter	meter	meter
Reporting frequency -	monthly	monthly	yearly	yearly	monthly	monthly
Reporting time lag	55 days	55 days			30 days	35 days
is comprehensive?						
is computerized?						
Hardware						
Software						
Age of system						
WHO REPORTS? tax data			no tax	no tax		
to	Dept of Revenue				ND Tax Comm	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
# of tax groups						
Oil and gas revenues						
is computerized?						
Hardware						

DESCRIPTION	NEBRASKA		NEW YORK		NORTH DAKOTA	
	OIL	GAS	OIL	GAS	OIL	GAS
Software						
Age of system						
WHO REPORTS? royalty data						
to	Board of Educational Lands & Funds				State Land Dept.	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
Oil and gas revenues						
FY 91/92 Mineral royalties and bonuses	\$939,497				\$5,200,000	
FY 91/92 Permanent fund balance	\$106,032,789				\$329,000,000	
State lands - # mineral acres managed	1,628,399				2,538,012	
# state leases						
is computerized?						
Hardware						
Software						
Age of System						

DESCRIPTION	OREGON		PENNSYLVANIA		UTAH	
	OIL	GAS	OIL	GAS	OIL	GAS
# transx points/ meters						
# meter operators						
# transporter/ gatherers						
# of operators			477		176	
Est. # producing wells					2085	913
Est. # non-producing and abandoned						
Prod/sales volumes in 1991			2 MMbbl	140 Bcf	2 MMbbl	81 Bcf
in 1992						
Reserve volumes 12/91						
12/92						
Natural gas consumption						
# federal leases						
# federal acres						
WHO REPORTS? conservation data						
to	Dept Geol & Min Ind 503 229-5580		Env Res, Oil & Gas Mgmt 717 787-4817		Dept Nat Res, Div Oil & Gas Mgmt 801 538-5340	
level	well	meter	well	well	meter	meter
Reporting frequency	sale mo	sale mo	yearly	yearly	monthly	monthly
Reporting time lag	30 days	30 days			45 days	45 days
is comprehensive?						
is computerized?						
Hardware						
Software						
Age of system						
WHO REPORTS? tax data			no tax	no tax		
to	Dept of Revenue				Utah Tax Comm	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
# of tax groups						
Oil and gas revenues						

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DESCRIPTION	OREGON		PENNSYLVANIA		UTAH	
	OIL	GAS	OIL	GAS	OIL	GAS
is computerized?						
Hardware						
Software						
Age of system						
WHO REPORTS? royalty data						
to	Div of State Lands				Div of State Lands & Forestry	
level						
Reporting frequency						
Reporting time lag						
# of remitters						
Oil and gas revenues						
FY 91/92 Mineral royalties and bonuses	\$405,000				\$8,671,000	
FY 91/92 Permanent fund balance	\$226,000,000				\$45,698,000	
State lands - # mineral acres managed	2,300,000				4,698,316	
# state leases						
is computerized?						
Hardware						
Software						
Age of System						

DESCRIPTION	WASHINGTON		WEST VIRGINIA	
	OIL	GAS	OIL	GAS
# transx points/meters				
# meter operators				
# transporter/ gatherers				
# of operators			749	
Est. # producing wells			1100	27600
Est. # non-producing and abandoned				
Prod/sales volumes in 1991			2 MMbbl	176 Bcf
in 1992				
Reserve volumes 12/91				
12/92				
Natural gas consumption				
# federal leases				
# federal acres				
WHO REPORTS? conservation data				
to	Dept of Nat Res 206 459-6372		WV OGCC, Energy Div 304 348-3026	
level	well	meter	well	meter
Reporting frequency	monthly	monthly	yearly	yearly
Reporting time lag	30 days	30 days		
is comprehensive?				
is computerized?				
Hardware				
Software				
Age of system				
WHO REPORTS? tax data	no tax	no tax		
to			State Tax Dept	
level				
Reporting frequency				
Reporting time lag				
# of remitters				
# of tax groups				
Oil and gas revenues				
is computerized?				
Hardware				
Software				

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DESCRIPTION	WASHINGTON		WEST VIRGINIA	
	OIL	GAS	OIL	GAS
Age of system				
WHO REPORTS? royalty data				
to	Comm of Public Lands			
level				
Reporting frequency				
Reporting time lag				
# of remitters				
Oil and gas revenues				
FY 91/92 Mineral royalties and bonuses	\$955,280			
FY 91/92 Permanent fund balance	\$393,359,407			
State lands - # mineral acres managed	3,268,829			
# state leases				
is computerized?				
Hardware				
Software				
Age of System				

Appendix C

Section 2

State Characteristics & Uniformity Guideline Weights

State Uniformity Guideline Weights

STATE UNIFORMITY GUIDELINE WEIGHTS

Introduction

During the UPRM Focus Group Review conference, held in Norman, Oklahoma on November 9 and 10, 1993, UPRM Advisory Committee members, key state agency contacts (from Kansas, Louisiana, New Mexico, Ohio, Oklahoma, Texas and Wyoming) and federal representatives were invited to review and discuss the overall Conceptual Model and the Implementation Requirements.

Conference attendees participated in group sessions broken out by agency type (Conservation, Tax, and Royalty) and then by state in order to closely review each Uniformity Guideline (*see Appendix A, Section 2*). Conference attendees were asked to assign guideline weights to individual Uniformity Guidelines indicating their assessment of the importance of each guideline to their agencies and to the overall Conceptual Model. The Uniformity Guidelines were rated on a scale of 1 to 5, with 1 denoting the lowest level of importance and 5 denoting the highest level of importance.

The Conference attendees' Uniformity Guideline weights were collected, compiled and entered into tables for review purposes and are presented in the following section.

R-1 A standard API Well Bore Number is used.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation					1	9	4.90	10
Tax	2	2				3	3.40	7
Royalty			1		3	3	4.14	7
Other						3	5.00	3
Totals	2	2	1	0	4	18	4.40	27

R-2 A STATE standard code is used to identify each well completion within each well bore.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1	2		2	2	3	3.44	10
Tax	1			5		1	3.33	7
Royalty		2			3	2	3.43	7
Other		1			1	1	3.33	3
Totals	2	5	0	7	6	7	3.40	27

R-3 A standard Business Associate code is used by the Conservation, Tax and Royalty agencies.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				2	2	6	4.40	10
Tax	1					6	5.00	7
Royalty	1					6	5.00	7
Other						3	5.00	3
Totals	2	0	0	2	2	21	4.76	27

R-4 Well bores are linked to operators on an effective-dated basis and the links are stored in a common database.

Information is not available.

R-5 Well completions are linked to state leases on an effective-dated basis and the links are stored in a common database.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	3	2		1	1	3	3.43	10
Tax	1	2		2	1	1	2.83	7
Royalty				1	1	5	4.57	7
Other		1		1		1	3.00	3
Totals	4	5	0	5	3	10	3.57	27

R-6 Well completions are linked to tax groups on an effective-dated basis and the links are stored in a common database.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	5	2		1	1	1	2.80	10
Tax	1	1		2	1	2	3.50	7
Royalty	3	2	1	1			1.75	7
Other	1	1				1	3.00	3
Totals	10	6	1	4	2	4	2.82	27

R-7 *Well completions are linked to their appropriate production allowables.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1	1		2		6	4.11	10
Tax	3	3		1			1.50	7
Royalty	4				1	2	4.67	7
Other	2	1					1.00	3
Totals	10	5	0	3	1	8	3.41	27

R-8 *Well completions are linked to units on an effective-dated basis and the links are stored in a common database.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation		2		2	2	4	3.60	10
Tax	1	3		1		2	2.67	7
Royalty			1	1	1	4	4.14	7
Other		1				2	3.67	3
Totals	1	6	1	4	3	12	3.54	27

R-9 *Transaction points are identified using a standard numbering system.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	2	1		2	1	4	3.88	10
Tax		1		1		5	4.14	7
Royalty			2	1	1	3	3.71	7
Other			1		1	1	3.67	3
Totals	2	2	3	4	3	13	3.88	27

R-10 Well completions are linked to transaction points on an effective-dated basis and the links are stored in a common database.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	2	1		1		6	4.25	10
Tax	2	2		2		1	2.60	7
Royalty			2	2	1	2	3.43	7
Other			1		1	1	3.67	3
Totals	4	3	3	5	2	10	3.57	27

R-11 A standard location X-Y-Z coordinate system (e.g. latitude/longitude/elevation) is used to identify the location of each well or transaction point.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				2	1	7	4.50	10
Tax	2	1	1	2	1		2.60	7
Royalty			2	3		2	3.29	7
Other				2		1	3.67	3
Totals	2	1	3	9	2	10	3.68	27

TC-1 Well test information is provided at the well completion level for all tested hydrocarbons and is stored in a common database.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1		5	5	1	8	3.63	20
Tax	2	4		3		2	2.56	11
Royalty	1	2	4	7			2.38	14
Other		1		2	1	2	3.50	6
Totals	4	7	9	17	2	12	3.06	51

TC-2 Production volumes are reported for each separately measured well completion with the transaction point identified.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation			2	1	1	6	4.10	10
Tax	1					6	5.00	7
Royalty			1	1	2	3	4.00	7
Other					1	2	4.67	3
Totals	1	0	3	2	4	17	4.35	27

TC-3 Tax volumes and values are reported at the tax group level with the transaction point identified.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	4	1		1		4	4.00	10
Tax						7	5.00	7
Royalty	1		1		2	3	4.17	7
Other	2					1	5.00	3
Totals	7	1	1	1	2	15	4.45	27

TC-4 Royalty volumes and values are reported at the state lease level with tax group and transaction point identified.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	5	1		1		3	3.80	10
Tax	1	2				4	3.67	7
Royalty				1	1	5	4.57	7
Other	1	1				1	3.00	3
Totals	7	4	0	2	1	13	3.95	27

TC-5 Production, Tax and Royalty volume information is reported for all commercial hydrocarbons.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				1		9	4.80	10
Tax						7	5.00	7
Royalty				1	1	5	4.57	7
Other						3	5.00	3
Totals	0	0	0	2	1	24	4.81	27

TC-6 Tax and Royalty value information is reported for all commercial hydrocarbon products severed or sold.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	5	1		2		2	3.40	10
Tax	1					6	5.00	7
Royalty				1		6	4.71	7
Other						3	5.00	3
Totals	6	1	0	3	0	17	4.52	27

TC-7 Conservation volume information is received as soon as possible, but no later than the last day of the month following the month of production.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1			2		7	4.56	10
Tax				1		6	4.71	7
Royalty			1	3	2	1	3.43	7
Other			1			2	4.00	3
Totals	1	0	2	6	2	16	4.23	27

TC-8 Tax and Royalty volume and value information is received as soon as possible, but no later than the last day of the second month following the month of production.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	4	1		3	1	1	3.17	10
Tax		2				5	3.86	7
Royalty			1		1	5	4.43	7
Other	1		1			1	3.50	3
Totals	5	3	2	3	2	12	3.82	27

TC-9 Information can be received and processed at any time prior to the due-date.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation		1		2	3	4	3.90	10
Tax		1		3		3	3.57	7
Royalty	1			2	1	3	4.17	7
Other				1		2	4.33	3
Totals	1	2	0	6	4	12	3.92	27

TC-10 Incentives and other programs are used to encourage timely and accurate reporting of information.

Information is not available.

TC-11 All volume dispositions are accounted for from the Production transaction point to the Tax or Royalty transaction point.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1	1	4		4		2.78	10
Tax			1	1	5		3.57	7
Royalty		1		1	5		3.43	7
Other				1	2		3.67	3
Totals	1	2	5	3	16	0	3.27	27

TC-12 Routine reporting requirements will include a provision for volume information to be reported by at least two parties with separate interests.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation		1	1	3	1	4	3.60	10
Tax	1	1		2		3	3.67	7
Royalty	1			1	2	3	4.33	7
Other			1		1	1	3.67	3
Totals	2	2	2	6	4	11	3.80	27

C-1 Information can be received by a state via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation			1	1	1	7	4.40	10
Tax				2		5	4.43	7
Royalty				2	1	4	4.29	7
Other						3	5.00	3
Totals	0	0	1	5	2	19	4.44	27

C-2 Information can be received by a state via magnetic media.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation		2	1	1	2	4	3.50	10
Tax			1	1		5	4.29	7
Royalty	1		2		1	3	3.83	7
Other					1	2	4.67	3
Totals	1	2	4	2	4	14	3.92	27

C-3 Information can be transmitted from state agencies via Electronic Data Interchange (EDI) using standard conventions for ASC X12 transaction sets.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation		1		2	1	6	4.10	10
Tax	1	1		3		2	3.33	7
Royalty			1	4	1	1	3.29	7
Other						3	5.00	3
Totals	1	2	1	9	2	12	3.81	27

C-4 Information can be transmitted from state agencies via magnetic media.

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1	1	1		3	4	3.89	10
Tax		1	1	4		1	2.86	7
Royalty	2	1	1	2	1		2.60	7
Other				1		2	4.33	3
Totals	3	3	3	7	4	7	3.38	27

C-5 *The use of electronic forms of communication is supported by a state.*

Information is not available.

V-1 *Each agency will internally validate and verify data to meet minimum data quality standards. Error statements will be returned to the reporters of the data.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation					3	7	4.70	10
Tax				1	1	5	4.57	7
Royalty						7	5.00	7
Other						3	5.00	3
Totals	0	0	0	1	4	22	4.78	27

V-2 *Conservation, Tax and Royalty agencies will cross-verify volume data.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				1	1	8	4.70	10
Tax		1				6	4.43	7
Royalty						7	5.00	7
Other						3	5.00	3
Totals	0	1	0	1	1	24	4.74	27

V-3 Tax and Royalty agencies will cross-verify value data.

Conservation	5		3	4	5	Average	10
Tax	1	2		1	3	Rating	3.60
Royalty			1		6	Number	7
Other	1				2	of Resp.	3
Totals	7	2	0	4	2		27

V-4 States will develop cross-agency verification procedures for handling exceptions and for resolving data discrepancies between agencies.

Conservation		1	1	2	3	Average	10
Tax	1		1	2	2	Rating	4.30
Royalty			4	1	2	Number	7
Other					3	of Resp.	3
Totals	1	0	2	7	5		27

V-5 Cross-agency data verification will begin no later than six months after the month of production.

Conservation	1		4	3	2	Average	10
Tax		1	2	1	3	Rating	3.78
Royalty	1		2	2	2	Number	7
Other	1				2	of Resp.	3
Totals	3	0	1	8	6		27

S-1 *Volume data provided includes: Well Tests*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation			1	5	2	2	3.50	10
Tax	2	2	1	1	1		2.20	7
Royalty	1	1	4	1			2.00	7
Other			1			2	4.00	3
Totals	3	3	7	7	3	4	2.92	27

S-2 *Volume data provided includes: Allowables*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1	1		2	2	4	3.89	10
Tax	2	3	1	1			1.60	7
Royalty	2	1	1	2		1	2.80	7
Other	2	1					1.00	3
Totals	7	6	2	5	2	5	2.90	27

S-3 *Volume data provided includes: Production Volumes*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation						10	5.00	10
Tax		1			2	4	4.14	7
Royalty						7	5.00	7
Other						3	5.00	3
Totals	0	1	0	0	2	24	4.78	27

S-4 Volume data provided includes: Tax Volumes

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	3		1	2		4	4.00	10
Tax		1		1	1	4	4.00	7
Royalty	1				1	5	4.83	7
Other	2					1	5.00	3
Totals	6	1	1	3	2	14	4.29	27

S-5 Volume data provided includes: Royalty Volumes

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	4			3		3	4.00	10
Tax		1	1	1	1	3	3.57	7
Royalty					1	6	4.86	7
Other	1	1				1	3.00	3
Totals	5	2	1	4	2	13	4.05	27

**S-6 Value data provided includes:
Tax Values and Value Basis**

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	3		1	2		4	4.00	10
Tax		1		1	1	4	4.00	7
Royalty	1				1	5	4.83	7
Other	2					1	5.00	3
Totals	6	1	1	3	2	14	4.29	27

**S-7 Value data provided includes:
Royalty Values and Value Basis**

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	4			3		3	4.00	10
Tax		1	1	1	1	3	3.57	7
Royalty					1	6	4.86	7
Other	1	1				1	3.00	3
Totals	5	2	1	4	2	13	4.05	27

S-8 Reference data provided includes: Well Completion

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				1	4	5	4.40	10
Tax	2	2	1	2			2.00	7
Royalty				3	2	2	3.86	7
Other	1				1	1	4.50	3
Totals	3	2	1	6	7	8	3.75	27

S-9 Reference data provided includes: Well Bore

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				3	1	6	4.30	10
Tax	2	3		2			1.80	7
Royalty		1	2	2		2	3.00	7
Other	1					2	5.00	3
Totals	3	4	2	7	1	10	3.46	27

S-10 Reference data provided includes: Unit

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	2		1	2	1	4	4.00	10
Tax	1	3		1	1	1	2.50	7
Royalty	1			1	2	3	4.33	7
Other						3	5.00	3
Totals	4	3	1	4	4	11	3.83	27

S-11 Reference data provided includes: State Lease

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	2	1		4		3	3.50	10
Tax		4		1		2	2.43	7
Royalty				1		6	4.71	7
Other	1					2	5.00	3
Totals	3	5	0	6	0	13	3.67	27

S-12 Reference data provided includes: Business Associate

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation		1	1	1	1	6	4.00	10
Tax		1		5		1	3.00	7
Royalty			1	1	2	3	4.00	7
Other	1				1	1	4.50	3
Totals	1	2	2	7	4	11	3.77	27

S-13 Reference data provided includes: Tax Group

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	4	1		3	1	1	3.17	10
Tax		1		3		3	3.57	7
Royalty	1	2	1	1		2	2.83	7
Other	2					1	5.00	3
Totals	7	4	1	7	1	7	3.30	27

**S-14 Relationship data provided includes:
Well Completion to Well Bore Link**

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				2	2	6	4.40	10
Tax	1	3		3			2.00	7
Royalty			1	3	1	2	3.57	7
Other	1				1	1	4.50	3
Totals	2	3	1	8	4	9	3.60	27

**S-15 Relationship data provided includes:
Well Completion to Unit Link**

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	2			2	1	5	4.38	10
Tax		3		2	1	1	2.57	7
Royalty				3		4	4.14	7
Other	1					2	5.00	3
Totals	3	3	0	7	2	12	3.83	27

**S-16 Relationship data provided includes:
Well Completion to Tax Group Link**

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	4		1	1	1	3	4.00	10
Tax		1		1	1	4	4.00	7
Royalty	3	1			1	2	3.75	7
Other	2					1	5.00	3
Totals	9	2	1	2	3	10	4.00	27

**S-17 Relationship data provided includes:
Well Completion to State Lease Link**

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	3			2	1	4	4.29	10
Tax		3		2		2	2.71	7
Royalty				1	1	5	4.57	7
Other	1					2	5.00	3
Totals	4	3	0	5	2	13	3.96	27

**S-18 Relationship data provided includes:
Well Completion to Transaction Point Link**

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	2		1	2	1	4	4.00	10
Tax	1	1	1	1		3	3.50	7
Royalty	1			3	2	1	3.67	7
Other				1		2	4.33	3
Totals	4	1	2	7	3	10	3.83	27

***S-19 Information is provided to the data user via:
Electronic Data Interchange (EDI)***

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation			1	2	1	6	4.20	10
Tax	1	1		1	1	3	3.83	7
Royalty	1			3		3	4.00	7
Other						3	5.00	3
Totals	2	1	1	6	2	15	4.16	27

***S-20 Information is provided to the data user via:
Magnetic Media***

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1	1		2	2	4	3.89	10
Tax	1	1	1	2	1	1	3.00	7
Royalty	2		1			4	4.40	7
Other					1	2	4.67	3
Totals	4	2	2	4	4	11	3.87	27

***S-21 Information is provided to the data user via:
On-line Inquiry***

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				1	2	7	4.60	10
Tax	1			3	2	1	3.67	7
Royalty	1		1	1		4	4.17	7
Other						3	5.00	3
Totals	2	0	1	5	4	15	4.32	27

S-22 *Information is provided to the data user via:
Paper Reports*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				4	3	3	3.90	10
Tax	1	1		4		1	3.00	7
Royalty	1		1	2	2	1	3.50	7
Other			1			2	4.00	3
Totals	2	1	2	10	5	7	3.60	27

S-23 *Information is provided to the data user via:
CD-ROM*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation	1	1	1	4	2	1	3.11	10
Tax	3	2		2			2.00	7
Royalty	2	2	1		2		2.40	7
Other				1		2	4.33	3
Totals	6	5	2	7	4	3	2.90	27

S-24 *Validated data should be released in a timely manner no later than one month after they are received by the agency.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				5		5	4.00	10
Tax	1	2	1	1		2	2.83	7
Royalty	1		3	2		1	2.83	7
Other					1	2	4.67	3
Totals	2	2	4	8	1	10	3.52	27

S-25 *Data will be provided to data users in standard output formats.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation		1		2	3	4	3.90	10
Tax	2	2		1	1	1	2.80	7
Royalty	1				3	3	4.50	7
Other				1		2	4.33	3
Totals	3	3	0	4	7	10	3.88	27

S-26 *Statistics will be provided to data users as a measure of data completeness.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				3	2	5	4.20	10
Tax	2	2		2		1	2.60	7
Royalty	1		1	2	2	1	3.50	7
Other					1	2	4.67	3
Totals	3	2	1	7	5	9	3.75	27

S-27 *In-process data discrepancies are identified for data users.*

	Not Rated	1	2	3	4	5	Average Rating	Number of Resp.
Conservation				1	4	5	4.40	10
Tax			2	3		2	3.29	7
Royalty	1			1		5	4.67	7
Other						3	5.00	3
Totals	1	0	2	5	4	15	4.23	27

Appendix D

Uniform Production Reporting Model

Questionnaire

Uniform Production Reporting Model

Questionnaire

QUESTIONNAIRE

Introduction

In order to gain a better understanding of current state and federal gas and oil processing systems, questionnaires were sent to state contacts within the targeted states (Kansas, Louisiana, New Mexico, Ohio, Oklahoma, Texas and Wyoming) and to MMS and BLM. The questionnaires were sent during the first two weeks of August, 1993 with responses requested by the end of August. The initial Conceptual Model for the UPRM project was developed based on the review of these returned questionnaires and on additional preliminary input received from state agencies.

A copy of the questionnaire is presented in the following section, and contains the following components:

Project Description

Organizational Questionnaire

Systems Questionnaire

Business Event Packet

Project Description

Table of Contents

PROJECT DESCRIPTION

Background material that introduces the project, its goals, timeframes, and participants.

ORGANIZATIONAL QUESTIONNAIRE

Questionnaire used to gain a basic understanding of the structure and the objectives related to oil and gas production functions of your agency.

SYSTEMS QUESTIONNAIRE

Questionnaire that will provide an understanding of the current systems used for oil and gas production information and the functions processed by each system.

BUSINESS EVENT PACKET

Investigation Framework

Background material that introduces the framework used to examine states' current systems and procedures. It is a "spud-to-plug" model that identifies the major phases and key business events in a typical well's life. The framework emphasizes those events that require some significant involvement by state government.

Questionnaire

Questionnaire used to verify the business event flows and event descriptions handled by your agency as they relate to oil and gas production functions.

RETURN EXPRESS ENVELOPE

Prepaid express envelope to be used to return the questionnaires and any other documentation that you may provide.

DEVELOPMENT OF A UNIFORM PRODUCTION REPORTING MODEL

PROJECT BACKGROUND

Industry and government policy makers depend heavily on the energy data collected by the regulatory agencies of oil and gas producing states. Small independent producers need production information to support operational decisions, state and federal policy-makers need production and producibility data for informed decisions, and the natural gas marketplace now increasingly is calling for information regarding the deliverability of natural gas at any supply point in the system. While natural gas could serve as a clean, efficient strategic fuel for the United States, its adoption as a leading energy source hinges upon consumer trust in its reliability. The foundation for that trust is timely and accurate information that details supply sources and their ability to meet demand.

While these various users are demanding better information from the states, the degree of rapid structural change of the natural gas industry is increasing the complexity of production reporting, and state agencies are facing resource limitations that impact their ability to be responsive to these needs. Several initiatives within and among producing states are underway to address some of these problems, but budget constraints preclude rapid progress. While the states recognize the need for the data and the urgency of the situation, they simply do not have the funds to respond.

In the Fall of 1992, the FERC/DOE Natural Gas Deliverability Task Force issued a summary report that urged cooperative federal and state efforts to improve the availability, consistency and reliability of data related to natural gas deliverability in the United States. From this impetus, the Department of Energy (DOE) is now developing strategies to address these needs, including a program to provide financial assistance to states for modernizing their reporting infrastructures. Preliminary efforts are underway to determine appropriate funding levels and processes for this state assistance program. To initiate the effort, the DOE has awarded a grant to the University of Oklahoma to identify the conceptual and financial parameters to develop state reporting systems that will address the national need for timely and reliable production data.

PARTICIPANTS

The Sarkeys Energy Center at the University of Oklahoma is leading a project team that brings a diversity of expertise and perspectives to address these significant issues. By granting this effort to a research university in a leading natural gas producing region, the DOE has identified a project team that has a broad understanding of energy issues but does not have a vested interest in the project outcome. The lead technical advisors for the project are Dr. Charles Mankin, the director of the Oklahoma Geological Survey who brings considerable expertise in national and state energy policy issues; and William Liedtke, a consultant for the energy industry with diverse experience in both the public and private sectors. Project team members from Andersen Consulting bring extensive experience in the conceptual design of large-scale data systems for both government and the energy industry.

PROJECT SPONSORS

The primary sponsor for the project is the U.S. Department of Energy. Additional funding is being provided from the State of Oklahoma through the Governor's office.

PROJECT GOALS

The primary objective for this project is to produce a conceptual model for a uniform production reporting system that would meet the needs of the various users of production data, and that could be adopted by states as a component of their regulatory reporting systems. This conceptual design would promote flexible and timely production reporting to support severance tax and conservation requirements at the state level, to streamline industry reporting requirements, to accommodate data standards emerging from cooperative state and industry efforts, and to help ensure an efficient, reliable market with clear pricing signals. In addition, the project will develop high-level estimates of the cost to implement this model in natural gas producing states. The recommended model and costs will be delivered to the DOE for incorporation into their strategic plan for a state financial assistance program.

This project will accomplish only the first step of a long-term solution. An implementation program for the recommended model will depend on responses from both the federal and state levels. Federal funding for a state assistance program must be approved through appropriate channels. An individual state's decision to participate in such a program will be contingent upon its assessment of the local impact of implementing all or parts of this model.

APPROACH

This project is structured to assure that regulatory and revenue agencies from key gas-producing and consuming states are the primary architects of this conceptual design. Input also will be sought from the Minerals Management Service as the primary reporting agency for natural gas from federal lands. The model will build on efforts that are currently underway to standardize components of the reporting regime, such as efforts to develop standards for electronic data interchange. As the model is being developed, it will be validated through interactions with the industry and governmental organizations that will be reporting or using the natural gas data. Key components of the effort will include:

1. the establishment of an 8 - 10 member State Agency Review Panel, organized through the Interstate Oil and Gas Compact Commission, to monitor the development of the conceptual model;
2. the identification several target states for site visits to obtain detailed design input, and to generate order-of-magnitude implementation cost and timeline estimates; input also will be sought from other producing states utilizing telephone and mail interactions;
3. the convening of a Focus Group conference, at which key representatives from private industry, federal and state organizations review the model from data-reporting, data-user, and regulatory perspectives.

TIMEFRAME

The project is being undertaken on an accelerated basis, and will last six months beginning July 1, 1993.

CONTACT

For additional information about the project, contact the University of Oklahoma's Geological Information Systems department: (405) 325-3131.

Organizational Questionnaire

D-6

ORGANIZATIONAL QUESTIONNAIRE

PURPOSE

This questionnaire will be used to gain an understanding of the structure and the objectives of your agency as they relate to oil and gas production functions. The objectives should include those governed by statute and those defined informally. Any changes to statutes that may currently be under consideration will also be identified.

INSTRUCTIONS

Please complete the questionnaire using the space provided and/or attach any additional documentation as appropriate.

If you have any questions, please call Geological Information Systems at the University of Oklahoma at (405) 325-3131.

TARGET AUDIENCE

This questionnaire should be completed by the representative of the agency that has been designated to participate in this study.

TIME REQUIREMENTS

This questionnaire should take approximately one hour to complete.

ORGANIZATIONAL QUESTIONNAIRE

ORGANIZATIONAL OBJECTIVES

Please describe, at a high level, the major objectives related to oil and gas production functions of your agency that are governed by statute.

Please describe the informal objectives related to oil and gas production functions that are currently in place within your agency.

ORGANIZATIONAL QUESTIONNAIRE

IOGCC STATUTE SUMMARIES

The attached summaries of statutes were compiled by the IOGCC in October 1991. Please identify any major changes to the statutes since 1991 and identify any changes that are currently under consideration.

Please identify any changes to the statutes or any issues that are not currently being addressed but that your agency would like to have considered in the future. Additionally, please provide a brief description as to why these issues exist and their impact to your agency.

ORGANIZATIONAL QUESTIONNAIRE

ORGANIZATION CHARTS

In order to gain a better understanding of the structure of your agency and its areas of responsibility, an organization chart(s) would be helpful. Please attach copies of any organization charts or any other documentation that would help us gain this understanding.

ORGANIZATIONAL QUESTIONNAIRE

PURPOSE

This questionnaire will be used to gain an understanding of the structure and the objectives of your agency as they relate to oil and gas production functions. The objectives should include those governed by statute and those defined informally. Any changes to statutes that may currently be under consideration will also be identified.

INSTRUCTIONS

Please complete the questionnaire using the space provided and/or attach any additional documentation as appropriate.

If you have any questions, please call Geological Information Systems at the University of Oklahoma at (405) 325-3131.

TARGET AUDIENCE

This questionnaire should be completed by the representative of the agency that has been designated to participate in this study.

TIME REQUIREMENTS

This questionnaire should take approximately one hour to complete.

ORGANIZATIONAL QUESTIONNAIREORGANIZATIONAL OBJECTIVES

Please describe, at a high level, the major objectives related to oil and gas production functions of your agency that are governed by statute.

- TO PROTECT THE PUBLIC (I.E. THE RATE PAYER)
- TO CONSERVE NATURAL RESOURCES IN OUR STATE
- TO LIMIT THE ENVIRONMENTAL IMPACT OF OIL AND GAS PRODUCTION

Please describe the informal objectives related to oil and gas production functions that are currently in place within your agency.

- NEED TO CHANGE SYSTEM SO IT HAS A FASTER RESPONSE RATE (I.E. ELIMINATE THE 2-3 WEEK LAG TIME FOR VALIDATION / VERIFICATION OF DATA)
- REDUCE ERROR RATE

ORGANIZATIONAL QUESTIONNAIREIOGCC STATUTE SUMMARIES

The attached summaries of statutes were compiled by the IOGCC in October 1991. Please identify any major changes to the statutes since 1991 and identify any changes that are currently under consideration.

- NO CHANGES ARE NECESSARY.
- NO CHANGES ARE UNDER CONSIDERATION CURRENTLY.

Please identify any changes to the statutes or any issues that are not currently being addressed but that your agency would like to have considered in the future. Additionally, please provide a brief description as to why these issues exist and their impact to your agency.

- TO CAPTURE WATER INFORMATION
- TO HAVE MULTIPLE REPORTERS (OPERATOR, MEASURER, AND PURCHASER) OF GAS PRODUCTION DATA
- TO ASSESS PENALTIES FOR EXCESSIVE REPORTING ERRORS

ORGANIZATIONAL QUESTIONNAIREORGANIZATION CHARTS

- In order to gain a better understanding of the structure of your agency and its areas of responsibility, an organization chart(s) would be helpful. Please attach copies of any organization charts or any other documentation that would help us gain this understanding.

Systems Questionnaire

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**Uniform Production
Reporting Model**

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SYSTEMS QUESTIONNAIRE

PURPOSE

*This questionnaire will act as the vehicle to gain an understanding of each automated **system** used by your agency for gathering, processing, and reporting of data that is related to oil and gas production information.*

*A **system** is defined as any integrated software package used to process data. A system can be broken down into components or **subfunctions**. A subfunction should correlate to one or more business events as detailed in the **BUSINESS EVENT QUESTIONNAIRE**.*

INSTRUCTIONS

Please complete the questionnaire using the space provided and/or attach any additional documentation as appropriate.

*The questionnaire provides a **SYSTEM DESCRIPTION** worksheet to describe each system at a high level. It also includes a **SUBFUNCTION DESCRIPTION** worksheet to outline in more detail each subfunction of a system.*

*Please complete a **SYSTEM DESCRIPTION** worksheet for each system and a **SUBFUNCTION DESCRIPTION** worksheet for each subfunction of that system. For each system referenced in the **BUSINESS EVENT QUESTIONNAIRE**, a **SUBFUNCTION DESCRIPTION** should be completed to detail the correlating business event.*

Additionally, please attach any system documentation, if available, that would provide a more complete understanding of each system.

If you have any questions, please call Geological Information Systems at the University of Oklahoma at (405) 325-3131.

TARGET AUDIENCE

*The worksheets provided in the questionnaire should be completed by the systems representative responsible for each system used by the agency. For each system, the appropriate systems representative should complete a **SYSTEM DESCRIPTION** worksheet for the system, and a **SUBFUNCTION DESCRIPTION** worksheet for each subfunction of the system.*

SYSTEM DESCRIPTION

TIME REQUIREMENTS

This questionnaire should take approximately one hour to complete for each system and its subfunctions.

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SYSTEM DESCRIPTION

SYSTEM NAME:

PLATFORM:

DESCRIPTION OF FUNCTIONALITY:

MAJOR DATABASES ACCESSED:

APPROXIMATE NUMBER OF:

Programs

Jobs

Screens

ORIGINAL IMPLEMENTATION DATE:

MAJOR ENHANCEMENTS:

Please provide a description of any enhancements and their completion dates made to date.

*Please provide a description of any **planned** enhancements and their target completion dates.*

SYSTEM DESCRIPTION

ANTICIPATED REMAINING LIFESPAN OF SYSTEM:

WORK LEVEL REQUIREMENTS:

Number of IS Support (full-time equivalents)

Number of Users

SUBFUNCTION DESCRIPTION

SYSTEM NAME:

SUBFUNCTION:

MAJOR INPUTS:

For each major data source, please describe the following:

- Sources of data
- Media of source data (paper, digital, EDI, etc.)
- Level of data (major entities)
- Level of confidentiality/public access

OUTLINE OF PROCESSING:

Please describe the sequential processing of the information through this subfunction.

Please provide the following:

- Cycle (daily, weekly, monthly, etc.)
- Number of transactions processed per cycle
- Number of errors processes per cycle
- Number of entities processed per cycle

MAJOR OUTPUTS:

For each output, please describe the following:

- Destinations of data
- Media of output data (hardcopy/reports, EDI, flat files, DB files, etc.)
- Level of data
- Level of confidentiality/public access

D-22

SYSTEM DESCRIPTION

SYSTEM NAME: GAS/OIL ALLOWABLE PRODUCTION SYSTEM (G/O AP)

PLATFORM: IBM 3090, MVS, CICS (ONLINE MONITOR), DB2

DESCRIPTION OF FUNCTIONALITY:

- TRACKS PRODUCTION FOR OIL AND GAS
- TRACKS RELEVANT TEST DATA
- CALCULATES ALLOWABLES

MAJOR DATABASES ACCESSED: GAS/OIL ALLOWABLE PRODUCTION MASTER FILE

APPROXIMATE NUMBER OF:

Programs	35-40
Jobs	15
Screens	2

ORIGINAL IMPLEMENTATION DATE: SEPTEMBER 1982

MAJOR ENHANCEMENTS:

Please provide a description of any enhancements and their completion dates made to date.

- ADDED FUNCTIONALITY TO PROCESS NEW DATA INPUT FORM XYZ, JANUARY 1990.
- ADDED FUNCTIONALITY TO DETERMINE IF A WELL IS AN OIL OR GAS WELL, SEPTEMBER, 1983.

*Please provide a description of any **planned** enhancements and their target completion dates.*

- WILL ADD EDI CAPABILITY/INTERFACE FOR INPUT FORMS ABC AND 123; SCHEDULED FOR IMPLEMENTATION 2ND QUARTER, 1994.

SYSTEM DESCRIPTION

ANTICIPATED REMAINING LIFESPAN OF SYSTEM: THRU 1998

WORK LEVEL REQUIREMENTS:

Number of IS Support (full-time equivalents) 6
Number of Users 2

SUBFUNCTION DESCRIPTION

SYSTEM NAME: GAS/OIL ALLOWABLE PRODUCTION SYSTEM (G/O AP)

SUBFUNCTION: PROCESS NATURAL GAS PRODUCTION REPORTS

MAJOR INPUTS:

For each major data source, please describe the following:

1. Meter Operator Report

- Sources of data - meter operators
- Media of source data (paper, digital, EDI, etc.) < hardcopy (required) digital
- Level of data (major entities) - completion zone
- Level of confidentiality/public access - no confidentiality in any of this agency's data.

OUTLINE OF PROCESSING:

Please describe the sequential processing of the information through this subfunction.

- GENERATE PRODUCTION REPORT
- UPDATE PRODUCTION REPORT INFORMATION
- PERFORM CAPTURE VALIDATION
- AUDIT PRODUCTION INFORMATION
- IDENTIFY EXCEPTIONS
- GENERATE FORM LETTER FOR EXCEPTIONS

Please provide the following:

- Cycle (daily, weekly, monthly, etc.) - monthly
- Number of transactions processed per cycle - 28,000
- Number of errors processes per cycle - 12,000
- Number of entities processed per cycle - 28,000

MAJOR OUTPUTS:

For each output, please describe the following:

1. Production Data

- Destinations of data - Allowables Calculation module
- Media of output data (hardcopy/reports, EDI, flat files, DB files, etc.) DB file
- Level of data - aggregated to lease level
- Level of confidentiality/public access - no confidentiality

2. Exception Letter

- Destinations - meter/well operator
- Media - hardcopy
- Level of Data - completion zone
- Confidentiality - no confidentiality

3. ETC.

Uniform Production
Reporting Model

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Business Event Packet

Uniform Production
Reporting Model

Investigation Framework

*Provided for Reference Only
No Action Required*

**Uniform Production
Reporting Model**

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PURPOSE

This document provides background information for the person(s) responsible for completing the Business Event Questionnaire. It should be reviewed and understood before completing the questionnaire, but the reader should understand that it contains no action items.

OVERVIEW

In order to communicate effectively and ensure the coverage of all important aspects of states' procedures and systems, the following **INVESTIGATION FRAMEWORK** was defined. This framework is the basis for the **BUSINESS EVENT QUESTIONNAIRE** and is documented here to provide an understanding of its structure and content.

The framework is modeled after the producing life of an ordinary well and is intended to cover the important aspects from "**SPUD-TO-PLUG**".

The first step is to break the producing life into the following **MAJOR PHASES**:

1. **DEVELOP**
2. **PRODUCE**
3. **ABANDON**

Each major phase is further broken down into **MAJOR BUSINESS EVENTS** -- representing significant milestones in a well's life. For the purposes of this project, only selected events will be considered for **PRIMARY EMPHASIS**. Primary events are those that involve the state agencies to a significant extent.

Finally, each business event is broken down into the **MAJOR PROCESSES** that take place during the event. This final level of detail is necessary to understand states' current procedures and systems.

ADDITIONAL DOCUMENTATION

Attached are two sections that present the framework in successive levels of detail. The first provides the **FRAMEWORK DIAGRAMS**, and the second provides a more detailed listing of **BUSINESS PROCESSES BY EVENT**.

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Investigation Framework

Framework Diagrams

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DEVELOP

Business Events

Events of Primary Emphasis

Events of Secondary Emphasis

Uniform Production
Reporting Model

PRODUCE

Business Events

Events of Primary Emphasis

Events of Secondary Emphasis

**Uniform Production
Reporting Model**

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ABANDON

Business Events

Events of Primary Emphasis

Events of Secondary Emphasis

Investigation Framework

Business Processes by Event

**Uniform Production
Reporting Model**

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Business Processes by Event

EVENT Process	Agency(ies) Primarily Involved		
	Conservation	Tax	Royalty

D
E
V
E
L
O
P

Lease Land

- 0.1 Apply for Lease
- 0.2 Assign/update lessee info
- 0.3 Assign lease number
- 0.4 Establish lease reference information
- 0.5 Grant lease

Apply for Permit to Drill

- 0.1 Capture permit
- 0.2 Review/decide on permit
- 0.3 Assign well bore number
- 0.4 Assign/update operator info
- 0.5 Establish well bore reference information
- 0.6 Establish well bore/lease relationship
- 0.7 Notify applicant

Drill

Apply for Permit to Complete/Re-Complete

- 0.1 Capture permit
- 0.2 Review/decide on permit
- 0.3 Assign well completion number
- 0.4 Assign/update operator BA info
- 0.5 Establish well reference information
- 0.6 Define well completion/well bore relationship
- 0.7 Notify applicant

Complete/Re-Complete

Install Production Facilities

Establish Sales Point Information

- 0.1 Receive sales point notification
- 0.2 Assign sales point number
- 0.3 Establish sales point reference information
- 0.4 Define well/sales point relationships

Establish Unit

- 0.1 Assign unit number
- 0.2 Establish unit reference information
- 0.3 Establish well completion to unit relationships
- 0.4 Establish operator

Define Tax Identification Group

- 0.1 Define level of taxation
- 0.2 Identify tax payer/tax remitter
- 0.3 Establish well completion/TID relationships
- 0.4 Notify tax payer/tax remitter

Business Processes by Event

EVENT Process	Agency(ies) Primarily Involved		
	Conservation	Tax	Royalty
Perform Well Test			
0.1 Capture test information			
0.2 Validate test information			
Inspect Well			
Assign/Update Allowables			
0.1 Review production/test information			
0.2 Calculate allowables			
0.3 Hear petitions for exception			
0.4 Set Allowables			
0.5 Notify operator of allowables			
Operate Well			
Process Production Information			
0.1 Capture production reports			
0.2 Perform capture validation			
0.3 Perform detailed validation			
0.4 Audit production/allowables			
0.5 Identify exceptions			
0.6 Notify operator of exceptions			
Process Severance Taxes			
0.1 Remittance processing			
0.2 Capture production & sales information			
0.3 Perform capture validation			
0.4 Perform detailed validation			
0.5 Process financials			
0.6 Identify audit candidates			
0.7 Perform Audit			
0.8 Notify tax-payer/tax-remitter of exceptions			
Process Royalty Information			
0.1 Remittance processing			
0.2 Capture production & sales information			
0.3 Perform capture validation			
0.4 Perform detailed validation			
0.5 Process financials			
0.6 Identify audit candidates			
0.7 Perform audit			
0.8 Notify lessor of exceptions			
Change Well Reference Information			

P
R
O
D
U
C
E

Business Processes by Event

EVENT Process	Agency(ies) Primarily Involved		
	Conservation	Tax	Royalty

A
B
A
N
D
O
N

Apply for Permit to Abandon

- 0.1 Capture permit
- 0.2 Review/decide on permit
- 0.3 Update well completion reference information
- 0.4 Notify operator

Plug and Abandon

Restore Site

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Business Event Questionnaire

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**Uniform Production
Reporting Model**

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BUSINESS EVENT QUESTIONNAIRE

PURPOSE

This questionnaire will be used to further define and update our understanding of specific business event flows and descriptions for your agency.

TARGET AUDIENCE

This questionnaire is composed of several business event flows and descriptions. Each business event flow and description should be completed by an agency representative with an understanding of the individual event.

Please mark any events that are not applicable to your agency. Likewise, additional blank event forms are located at the back of the packet for your convenience if you need to document a new event.

INSTRUCTIONS

Event Flows

Please correlate, at a high level, each business event flow with the actual event flow for your agency. Feel free to change, add or delete any components necessary to make the event flow correspond with your agency. Additionally, please show any changes that are likely to occur in the future.

*Each step in the event flow is documented with an **M** or an **S** to designate whether this step is performed *Manually* or by a *System*. Please mark the corresponding method that occurs in each step and identify the system name where appropriate.*

Confidentiality of the data may be a concern of your agency. Please mark any steps in the event flow in which the data are confidential.

Event Descriptions

Please describe, at a high level, each business event for your agency.

If you have any questions, please call Geological Information Systems at the University of Oklahoma at (405) 325-3131.

TIME REQUIREMENTS

Each event within this questionnaire should take approximately 15 minutes to complete. Note that the total time to complete this questionnaire will depend on the number of events handled by a particular agency.

PROCESS PRODUCTION INFORMATION - NATURAL GAS

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities. *No Confidentiality*

Name: _____

State: OK

Dept/Group: _____

Uniform Production
Reporting Model

* Example *

Event Description

This agency obtains data from: typically operator of well site gas meter or custody transfer meter,
ultimately the operator of the well

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: *

hardcopy
digital (tape/disk)
EDI
other: _____

% of trnx

20%

80%

Form Number(s): 1004/1005

* ALL must file hardcopy
even if filed on tape

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: ONE month

These data are processed to obtain: ENSURE RESPONSIBLE PARTY HAS FILED PRODUCTION DATA

The following items are assigned or established based on these data: ALLOWABLES ARE CALCULATED
BASED ON PRODUCTION AND TEST DATA

Primary end-user(s) for this process is: OKLAHOMA CORPORATION COMMISSION

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

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BUSINESS EVENT QUESTIONNAIRE

Develop

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**Uniform Production
Reporting Model**

LEASE LAND

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy _____ Form Number(s): _____
 digital (tape/disk) _____ _____
 EDI _____ _____
 other: _____ _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

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APPLY FOR PERMIT TO DRILL

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy digital (tape/disk) EDI other: _____ % of trnx _____ Form Number(s): _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

0-54

APPLY FOR PERMIT TO COMPLETE/RECOMPLETE

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy _____ Form Number(s): _____
 digital (tape/disk) _____ _____
 EDI _____ _____
 other: _____ _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

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ESTABLISH SALES POINT INFORMATION

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

 

ESTABLISH UNIT

Event Flow

(Includes Secondary Development Units)

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy % of trnx Form Number(s): _____
 digital (tape/disk) _____
 EDI _____
 other: _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

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DEFINE TAX IDENTIFICATION GROUP

Event Flow

D-61

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

SECRET

This agency obtains data from: _____

at the detail level on:	well completion/zone	well bore	reservoir/zone	note	sales point	county	state	region
-------------------------	----------------------	-----------	----------------	------	-------------	--------	-------	--------

The age of the data when received by this agency is: day week month year

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain:

The following items are assigned or established based on these data:

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters FOCs Federal Govt. EDCs Consumers Financial Markets Other agencies: _____

BUSINESS EVENT QUESTIONNAIRE

Produce

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**Uniform Production
Reporting Model**

PERFORM WELL TEST

Event Flow

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Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy digital (tape/disk) EDI other: _____ % of trnx _____ Form Number(s): _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

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ASSIGN/UPDATE ALLOWABLES

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy _____ Form Number(s): _____
 digital (tape/disk) _____ _____
 EDI _____ _____
 other: _____ _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

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PROCESS PRODUCTION INFORMATION

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of:

	% of trnx
hardcopy	_____
digital (tape/disk)	_____
EDI	_____
other: _____	_____

Form Number(s): _____

The age of the data when received by this agency is: day week month other:_____

The time interval the data represent is: day week month quarter year other:_____

The time required for this event to come to closure is:_____

These data are processed to obtain: _____

The following items are assigned or established based on these data:_____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies:_____

De D

PROCESS SEVERANCE INFORMATION

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of:

hardcopy
digital (tape/disk)
EDI
other: _____

% of trnx

Form Number(s): _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

D-71

PROCESS ROYALTY INFORMATION

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Uniform Production
Reporting Model

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy _____ Form Number(s): _____
 digital (tape/disk) _____ _____
 EDI _____ _____
 other: _____ _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

D-73

BUSINESS EVENT QUESTIONNAIRE

Abandon

D-74

APPLY FOR PERMIT TO ABANDON

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____ Dept/Group: _____

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy _____ Form Number(s): _____
 digital (tape/disk) _____
 EDI _____
 other: _____ _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

D-76

Blank Event Forms

D-77

D-78

Event Flow

D-79

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

State: _____

Dept/Group: _____

**Uniform Production
Reporting Model** ____

Event Description	
1	1. The first event is a 100m sprint. The winner of this event is the fastest runner in the field.
2	2. The second event is a 200m sprint. The winner of this event is the fastest runner in the field.
3	3. The third event is a 400m sprint. The winner of this event is the fastest runner in the field.
4	4. The fourth event is a 800m sprint. The winner of this event is the fastest runner in the field.
5	5. The fifth event is a 1600m sprint. The winner of this event is the fastest runner in the field.
6	6. The sixth event is a 3200m sprint. The winner of this event is the fastest runner in the field.
7	7. The seventh event is a 6400m sprint. The winner of this event is the fastest runner in the field.
8	8. The eighth event is a 12800m sprint. The winner of this event is the fastest runner in the field.
9	9. The ninth event is a 25600m sprint. The winner of this event is the fastest runner in the field.
10	10. The tenth event is a 51200m sprint. The winner of this event is the fastest runner in the field.
11	11. The eleventh event is a 102400m sprint. The winner of this event is the fastest runner in the field.
12	12. The twelfth event is a 204800m sprint. The winner of this event is the fastest runner in the field.
13	13. The thirteenth event is a 409600m sprint. The winner of this event is the fastest runner in the field.
14	14. The fourteenth event is a 819200m sprint. The winner of this event is the fastest runner in the field.
15	15. The fifteenth event is a 1638400m sprint. The winner of this event is the fastest runner in the field.
16	16. The sixteenth event is a 3276800m sprint. The winner of this event is the fastest runner in the field.
17	17. The seventeenth event is a 6553600m sprint. The winner of this event is the fastest runner in the field.
18	18. The eighteenth event is a 13107200m sprint. The winner of this event is the fastest runner in the field.
19	19. The nineteenth event is a 26214400m sprint. The winner of this event is the fastest runner in the field.
20	20. The twentieth event is a 52428800m sprint. The winner of this event is the fastest runner in the field.
21	21. The twenty-first event is a 104857600m sprint. The winner of this event is the fastest runner in the field.
22	22. The twenty-second event is a 209715200m sprint. The winner of this event is the fastest runner in the field.
23	23. The twenty-third event is a 419430400m sprint. The winner of this event is the fastest runner in the field.
24	24. The twenty-fourth event is a 838860800m sprint. The winner of this event is the fastest runner in the field.
25	25. The twenty-fifth event is a 1677721600m sprint. The winner of this event is the fastest runner in the field.
26	26. The twenty-sixth event is a 3355443200m sprint. The winner of this event is the fastest runner in the field.
27	27. The twenty-seventh event is a 6710886400m sprint. The winner of this event is the fastest runner in the field.
28	28. The twenty-eighth event is a 13421772800m sprint. The winner of this event is the fastest runner in the field.
29	29. The twenty-ninth event is a 26843545600m sprint. The winner of this event is the fastest runner in the field.
30	30. The thirtieth event is a 53687091200m sprint. The winner of this event is the fastest runner in the field.
31	31. The thirty-first event is a 107374182400m sprint. The winner of this event is the fastest runner in the field.
32	32. The thirty-second event is a 214748364800m sprint. The winner of this event is the fastest runner in the field.
33	33. The thirty-third event is a 429496729600m sprint. The winner of this event is the fastest runner in the field.
34	34. The thirty-fourth event is a 858993459200m sprint. The winner of this event is the fastest runner in the field.
35	35. The thirty-fifth event is a 1717986918400m sprint. The winner of this event is the fastest runner in the field.
36	36. The thirty-sixth event is a 3435973836800m sprint. The winner of this event is the fastest runner in the field.
37	37. The thirty-seventh event is a 6871947673600m sprint. The winner of this event is the fastest runner in the field.
38	38. The thirty-eighth event is a 13743895347200m sprint. The winner of this event is the fastest runner in the field.
39	39. The thirty-ninth event is a 27487790694400m sprint. The winner of this event is the fastest runner in the field.
40	40. The fortieth event is a 54975581388800m sprint. The winner of this event is the fastest runner in the field.
41	41. The forty-first event is a 109951162777600m sprint. The winner of this event is the fastest runner in the field.
42	42. The forty-second event is a 219902325555200m sprint. The winner of this event is the fastest runner in the field.
43	43. The forty-third event is a 439804651110400m sprint. The winner of this event is the fastest runner in the field.
44	44. The forty-fourth event is a 879609302220800m sprint. The winner of this event is the fastest runner in the field.
45	45. The forty-fifth event is a 1759218604441600m sprint. The winner of this event is the fastest runner in the field.
46	46. The forty-sixth event is a 3518437208883200m sprint. The winner of this event is the fastest runner in the field.
47	47. The forty-seventh event is a 7036874417766400m sprint. The winner of this event is the fastest runner in the field.
48	48. The forty-eighth event is a 14073748835532800m sprint. The winner of this event is the fastest runner in the field.
49	49. The forty-ninth event is a 28147497671065600m sprint. The winner of this event is the fastest runner in the field.
50	50. The fiftieth event is a 56294995342131200m sprint. The winner of this event is the fastest runner in the field.
51	51. The fifty-first event is a 112589990684262400m sprint. The winner of this event is the fastest runner in the field.
52	52. The fifty-second event is a 225179981368524800m sprint. The winner of this event is the fastest runner in the field.
53	53. The fifty-third event is a 450359962737049600m sprint. The winner of this event is the fastest runner in the field.
54	54. The fifty-fourth event is a 900719925474099200m sprint. The winner of this event is the fastest runner in the field.
55	55. The fifty-fifth event is a 1801439850948198400m sprint. The winner of this event is the fastest runner in the field.
56	56. The fifty-sixth event is a 3602879701896396800m sprint. The winner of this event is the fastest runner in the field.
57	57. The fifty-seventh event is a 7205759403792793600m sprint. The winner of this event is the fastest runner in the field.
58	58. The fifty-eighth event is a 14411518807585587200m sprint. The winner of this event is the fastest runner in the field.
59	59. The fifty-ninth event is a 28823037615171174400m sprint. The winner of this event is the fastest runner in the field.
60	60. The sixtieth event is a 57646075230342348800m sprint. The winner of this event is the fastest runner in the field.
61	61. The sixty-first event is a 115292150460684697600m sprint. The winner of this event is the fastest runner in the field.
62	62. The sixty-second event is a 230584300921369395200m sprint. The winner of this event is the fastest runner in the field.
63	63. The sixty-third event is a 461168601842738790400m sprint. The winner of this event is the fastest runner in the field.
64	64. The sixty-fourth event is a 922337203685477580800m sprint. The winner of this event is the fastest runner in the field.
65	65. The sixty-fifth event is a 1844674407370955161600m sprint. The winner of this event is the fastest runner in the field.
66	66. The sixty-sixth event is a 3689348814741910323200m sprint. The winner of this event is the fastest runner in the field.
67	67. The sixty-seventh event is a 7378697629483820646400m sprint. The winner of this event is the fastest runner in the field.
68	68. The sixty-eighth event is a 14757395258967641292800m sprint. The winner of this event is the fastest runner in the field.
69	69. The sixty-ninth event is a 29514790517935282585600m sprint. The winner of this event is the fastest runner in the field.

This agency obtains data from: _____

at the detail level of:	well completion/zone	well bore	lease/sub-lease	field	sales point	county	state	region
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		% of trnx		
in the form of:	hardcopy	_____	Form Number(s):	_____
	digital (tape/disk)	_____		_____
	EDI	_____		_____
	other: _____	_____		_____

The age of the data when received by this agency is: day week month other:_____

The time interval the data represent is: day week month quarter year other:_____

The time required for this event to come to closure is: _____

These data are processed to obtain:_____

The following items are assigned or established based on these data:_____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies:_____

Event Flow

Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

Uniform Production
Reporting Model

State: _____ Dept/Group: _____

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: % of trnx Form Number(s): _____
hardcopy _____
digital (tape/disk) _____
EDI _____
other: _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

Event Flow

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Please modify the Event Flow as necessary to reflect your state/agency's specific activities.

Name: _____

**Uniform Production
Reporting Model** _____

State: _____ **Dept/Group:** _____

Event Description

This agency obtains data from: _____

at the detail level of: well completion/zone well bore lease/sub-lease field sales point county state region

in the form of: hardcopy _____ Form Number(s): _____
 digital (tape/disk) _____ _____
 EDI _____ _____
 other: _____ _____

The age of the data when received by this agency is: day week month other: _____

The time interval the data represent is: day week month quarter year other: _____

The time required for this event to come to closure is: _____

These data are processed to obtain: _____

The following items are assigned or established based on these data: _____

Primary end-user(s) for this process is: _____

Other users of the data generated in this process include:

Operators Marketers Transporters PUCs Federal Govt. LDCs Consumers Financial markets Other agencies: _____

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Appendix E

Uniform Production Reporting Model

EDI Documentation

ELECTRONIC DATA INTERCHANGE (EDI)

Introduction

Electronic Data Interchange (EDI) can be loosely defined as the direct computer-to-computer interchange of business documents. Within the Uniformity Guidelines of the UPRM, the use of EDI is encouraged as a method of data exchange. Since many potential users of the UPRM are not currently familiar with EDI practices, the following pages are presented as background information.

The value and potential benefits of EDI can be best understood by reviewing how one company might, for example, handle a single purchase order sent to a second company. The clerical support staff of the first company might receive a request for a new box of pencils. The staff may issue a purchase order number for the request and then type the information into a purchase order form on a personal computer, print it out, and mail or fax it to the second company. Clerical staff at the second company would receive the order, identify the information needed to process the order, and enter the information into their computer system.

In this scenario, the purchase order information is manually entered into two separate computer systems, and the exchange of information between the two companies is delayed while the order is "in the mail." Through the use of EDI, purchase order information could be entered into the first company's computer and sent directly to the second company's computer. Improved customer service, improved data accuracy, reduced error rates, reduced data re-entry, faster information exchange and the possibility for lower inventories and costs are among the potential benefits or advantages of transferring business documents between companies via EDI. Potential disadvantages of using EDI could include the requirement of a high level of support from management and the difficulty in quantifying the return on investments.

The following discussion of EDI includes information on:

- Standards
- Conventions
- Communications, and
- Software.

Standards

Standards are used to enable incompatible computer and communication systems to exchange information. Since each company or trading partner uses, stores, handles, and exchanges information in different ways, the direct computer-to-computer interchange of business documents becomes nearly impossible without standards. For example, the exchange of purchase order information between companies can become complex due to the number of different purchase order forms in use. Definitions of terms can also become blurred across industries and corporate cultures.

Currently recognized EDI standards include proprietary standards, industry specific standards, and national and international standard formats. International EDI standards are defined by the United Nations Electronic Data Interchange for Administration, Commerce, and Transportation (EDIFACT). In the U.S., national standards are defined by the American National Standards Institute (ANSI), Accredited Standards Committee (ASC) X12.

Standards developed and approved by the ASC X12 committee are published in draft form for trial use. Draft standards are reviewed and used by industry and government groups as de facto standards. Trial use may continue for a year or more, and modifications or additional drafts may be published before an ASC X12 EDI standard eventually becomes an official ANSI standard. ANSI and ASC X12 standards are based on business document types such as invoices, purchase orders, shipping schedules, etc. Those business document types are called transaction sets. A group of transaction sets consists of the following:

- A **Communication Envelope** includes the communication transport protocol. The communication envelope could be thought of as the way a package is being shipped.
- An **Interchange Envelope** includes the interchange control header and trailer. This could be thought of as the address and return label on the package sent from one trading partner to another.

- One or more **Functional Groups** include a functional group header and trailer. Functional Groups can be thought of as large envelopes that contain all the like business documents sent in the package. For example, all the invoices would be in a single Functional Group. All the purchase orders would be in another Functional Group.
- One or more **Transaction Sets** in each Functional Group consist of a transaction set header and trailer. These are the individual business documents sent from one trading partner to another; they contain information such as company name, address, terms, etc. that apply to the entire document.
- **Detail Data Segments** include all the detail information to complete the business document in each Transaction Set. This could include specific information for a purchase order such as quantities, item numbers, descriptions, etc.

All of this information can be handled directly by computers in the day-to-day operations of sending and receiving purchase orders, invoices, or other business documents. EDI standards define the way information should be organized so that trading partners can exchange information. EDI standards make no assumptions about how each trading partner actually stores, handles, or manages business documents once they receive them.

Conventions

In addition to using standards to send and receive defined business documents, trading partners must decide:

- Which ASC X12 transaction sets should be used for each industry specific document.
- How to define terms within each industry.

Industry groups representing corporations, state and government agencies, and other concerned parties have created industry specific committees that define *Conventions* or *Document Standards*. These conventions identify how an industry should use an ASC X12 transaction set for specific business documents. In this manner, each company within an industry can agree to use the same transaction set in the same way. This further facilitates information interchange between trading partners.

Data Dictionaries are used to define the various terms used within an industry. These dictionaries allow a trading partner to identify common terms. For example, one company may call a catalog reference number a "listing number" while a second company might call it a "product number". By using a common dictionary for terms, each trading partner can understand what other trading partners are trying to communicate. Considering how many changes in terminology occur within an industry across geographical and cultural zones, a data dictionary can become the resource that enables trading partners to understand each other without the confusion of constantly re-defining terminology.

In the petroleum industry, the Petroleum Industry Data Exchange Committee (PIDX) chartered by the American Petroleum Institute (API) has been working to develop and promote the use of standards for EDI. Individual "User Groups" within PIDX work to develop and maintain the conventions for the use of EDI standards.

The PIDX Regulatory User Group "REGS" is one such group. This group consists of representatives from the petroleum industry and governmental agencies involved in the regulation of upstream business and accounting functions. By defining document standards or conventions for regulatory reporting purposes, the petroleum industry is able to communicate information in a standard way to each state and federal agency using the same conventions. This makes the interchange of business documents between the petroleum industry and state and federal governments much simpler since one industry-wide convention is used rather than multiple individual state and federal proprietary conventions.

Subcommittees within the REGS group of PIDX have developed draft transaction sets which can be used by the petroleum industry and by state and federal agencies which regulate oil and gas production reporting.

- The **Operational Subcommittee** has completed mapping the REGS convention of ASC X12 Transaction Set 863 (Well Test Report), and ASC X12 Transaction Set 867 (Production Report),
- the **Royalty Work Group within the Finance Subcommittee** has completed mapping of the REGS convention of ASC X12 Transaction Set 185 (Royalty Regulatory Report), and
- the **Tax Work Group within the Finance Subcommittee** has completed mapping of the REGS convention of ASC X12 Transaction Set 813 (Tax Report).

In addition, a committee of PIDX has created and maintains a data dictionary. The Petroleum Industry Data Dictionary (PIDD) is maintained by representative members from the petroleum industry, vendors, and government agencies. The PIDD's policy statement is to "provide data dictionary support for PIDX EDI applications and to be the repository of the best definitions available from any source (modeling efforts, academia, research labs, industry, etc.)". The PIDD has been used to consolidate and cross-reference the differing business terms and definitions within the petroleum industry.

Communications

In order to achieve the direct computer-to-computer interchange of business documents, each trading partner's computer must be able to communicate with other computers. This can be accomplished by using a direct network between trading partners or by using one or more third-party EDI network providers called Value Added Networks (VANs). Although the direct network approach seems appealing since a trading partner has controlled access to the transaction set and potentially lower costs in receiving business documents, the disadvantages of a direct network can include:

- The cost and effort of supporting multiple communication protocols
- The cost and effort of maintaining current communication standards
- Potential lost business due to component failure on a 24-hour access system
- Potential forced scheduling for access times due to unpredictable peaks and lulls in traffic.

While direct networks provide one solution, many trading partners prefer to use VANs to exchange business documents. VANs work much like a post office. The VANs provide electronic "mailboxes" that hold a trading partner's incoming documents and allow them to retrieve and send documents. The VAN takes care of routing the business documents to the appropriate trading partner (in some situations this might be on another VAN and would therefore incur additional transmission costs). The business document ends up in the electronic "mailbox" of the recipient trading partner for their computer to pick up when it connects to the VAN.

Potential advantages of Value Added Networks (VANs) can include:

- Increased availability, since when a company's system is off-line, the VAN can still handle its EDI traffic

- Near 24-hour uptime for around-the-clock access to allow computer systems to process transactions outside of normal business hours
- Increased built-in error correction, security, and audit trails
- Increased support of communication protocols.

Potential disadvantages of VANs can include:

- Higher transaction costs
- Potential document loss within the VANs
- Liability concerns.

Specific communication standards associated with document transmission are not discussed here. Further discussion of CCITT's X.25, X.400, and X.435 standards can be found in the references listed at the end of this section.

Software

Translation software packages are used to convert a trading partner's internal format for business documents into the appropriate EDI standard using document standards or conventions. For example, a translation software package could convert an invoice from a trading partner's internal format into the ASC X12 Invoice format using the appropriate industry convention. The software package could then connect to another trading partner's network or VAN and route the Invoice to that trading partner. The receiving trading partner would pick up or receive their transactions and use a translation software package to convert the ASC X12 Invoice format to their own internal format using the appropriate industry convention. The direct computer-to-computer interchange of business documents would then be completed.

Closing Remarks

In-depth discussions of communications standards, hardware, EDI integration, legal issues, technological issues, security issues, etc. were not included here. Further information on those issues can be found in the following references.

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Appendix F

Uniform Production Reporting Model

PI GRID Code Assignment

PI GRID CODE ASSIGNMENT

Introduction

Petroleum Information (PI) GRID Codes are an evolving national standard for identifying transaction points such as meters or custody transfer points. The following section contains information on the PI GRID Code format, content and assignments. This information was collected in order to gain a better understanding of the efforts currently underway to assign unique codes to transaction points.

FERC EBB WORKING GROUP #5
FINAL RECOMMENDATIONS CONCERNING
TRANSACTION POINT COMMON CODES

SUBMITTED TO THE
THE FEDERAL ENERGY REGULATORY COMMISSION
UNDER DOCKET NO. RM93-4-000:
STANDARDS FOR ELECTRONIC BULLETIN BOARDS
REQUIRED UNDER PART 284 OF THE COMMISSION'S REGULATIONS

OCTOBER 12, 1993

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I. EXECUTIVE SUMMARY

In the Federal Energy Regulatory Commission's ("Commission") Notice Of Proposed Rulemaking, which was promulgated on July 29, 1993 in Docket RM93-4-000, the Commission requested Electronic Bulletin Board Working Group #5 (Common Codes) to submit a report to the Commission by October 1, 1993 concerning Working Group #5's final proposal on transaction point common codes. Working Group #5 ("WG5") is submitting this report in fulfillment of the Commission's request.

This report will address only common codes for gas transaction points. The issues still outstanding with regard to company identification common codes will be addressed in the WG5 report that will be submitted to the Commission on February 1, 1994. Consequently, any reference to "common codes" in this report pertains only to transaction point common codes.

On July 1, 1993, WG5 submitted a report to the Commission entitled: "Progress Report of Working Group #5: Common Codes", hereinafter referred to as the "July 1st report". Rather than repeating the material presented in the earlier report, this report will focus on the resolution of those issues that were still outstanding as of the July 1st report. Thus, the Commission should note that the working group's organization, goals, and underlying approach to common codes has remained unchanged since the July 1st report. Also unchanged are the group's prior consensus recommendations. Thus, the Commission should consider the earlier report as remaining valid and unchanged relative to the group's continued efforts.

Since the July 1st report, WG5 has held two meetings in Washington, D.C.: August 24-25 and September 23-24. During the course of these two meetings, WG5 reached a unanimous consensus on three critical issues: 1) reaffirmation of the WG5 consensus recommendations reported in the July 1st report, 2) the selection of Petroleum Information Corporation ("PI") as the assignor of transaction point common codes, and 3) the selection of PI GRID Code as the common code structure for identifying gas transaction points on the nation's natural gas grid. Once the common code and the Code Assignor had been selected, the group's efforts shifted to determining both the procedures for assigning and validating common codes, the institutional

arrangements necessary to effect the development of a transaction point common code data base, and the implementation schedule for creating and distributing the common code data base.

The recommendations contained in this report reflect the consensus opinion of a number of participants, each of whom has a different role and function in the natural gas industry. Many market participants, especially those who conduct business across multiple pipelines, see the benefits of a cross-referencing system of common codes. By endorsing the method and outcome proposed by WG5, the Commission will help ensure that the majority of the requirements it places on the industry in any upcoming Order in this docket will have been developed by market participants to improve market efficiency, and will therefore be responsive to the needs of the industry as a whole.

This report is comprised of seven main sections: Executive Summary, Working Group #5's Consensus Approach, Transaction Point Common Code Encoding Procedures, Transaction Point Common Code Implementation & Schedule, Institutional Arrangements, Additional Issues, Conclusions and Recommendations, and an Appendix.

II. WORKING GROUP #5'S CONSENSUS APPROACH

A. Working Group #5's Perspective On Transaction Point Common Codes

As reported in WG5's July 1st report to the Commission, WG5 came to the agreement that "a natural gas industry common code is necessary to uniquely identify gas transaction points to facilitate transactions between trading partners." Common code usage primarily assists parties who are managing gas transportation transactions that involve multiple pipelines. Common code usage aids multiple pipeline transactions, for example, by 1) providing a unique common code for each proprietary code and 2) allowing users to identify multiple proprietary codes associated with a unique location (e.g. at an interconnect). In this context, a customer's management information system would be able to coordinate gas transfers at an interconnect using a single location identifier rather than having to reference two distinct proprietary codes employed by the interconnecting pipelines which are not otherwise cross-referenced. A common code creates a universal "language" that can be readily understood by all gas market participants, irrespective of where they are located on the nation's gas grid. Without a transaction point common code, customers would have to speak different "languages" in different parts of the country, on different portions of the nation's gas grid.

Although universal common codes usage currently is desired by some market participants, some market participants have indicated that the universal implementation of common codes would not be easy. In the current environment, the implementation of common codes faces the following problems:

- the customer demand for common codes and proprietary codes;
- the cost associated with universal common code implementation;

- the orderly implementation of common codes; and
- the need for consistent communication with pipeline customers.

While there are some parties who will be managing a plethora of transactions occurring over multiple pipelines, there will also be a large number of customers who will be shipping their gas over just one or two pipelines. The former pipeline customers might benefit from the use of a common code, while the latter customers might prefer to continue to use proprietary codes to satisfy their requirements. Moreover, for customers shipping gas over only a couple of pipelines, the cost of reconfiguring their computer systems to use common codes might substantially outweigh the benefits of their use.

WG5's consensus approach does not require the simultaneous implementation of common codes across all gas markets. At the same time, this approach provides the industry with a customer driven process (that requires monitoring) towards a broad implementation of the common code. Moreover, the working group consensus allows gas industry participants who would benefit from using common codes the opportunity to do so now, while others can continue to use proprietary codes until their requirements change.

B. Elements Of The Working Group #5 Consensus Recommendations On The Use Of Transaction Point Common Codes

The basic premise of the WG5 consensus on common codes is that pipelines and their customers should be permitted to continue conducting business as they currently do, using their proprietary codes. Parties who conduct transactions across multiple pipelines and need common codes either to facilitate coordination within their internal computer systems or to communicate with their trading partners (e.g., producers, LDCs, marketers, etc.) would have access to a common code system that is supported and verified by the interstate pipelines. Based on this premise, the specific consensus recommendations of WG5 are:

1. Owner/operators of gas transaction points will provide sufficient information concerning their points to the Code Assignor. The Code Assignor will establish a cross-reference between the proprietary codes and the common

codes assigned to those points. Owner/operators will verify that the information is correct and that the gas transaction points are properly identified. This process will initially begin with the interstate pipelines under FERC jurisdiction and eventually could be extended to all transaction points on the nation's gas grid.

2. Owner/operators will ensure that this information will be kept current, and that the addition of any new transaction points will be quickly relayed to the Code Assignor for a common code assignment.
3. Owner/operators can continue to conduct business using their proprietary codes for all gas transactions. All parties in the market, including pipelines, could eventually evolve toward communications using common codes, based on customer demand for common codes.
4. Business trading partners who operate across multiple pipelines could use the common code to coordinate their transactions while using the cross-reference to use pipeline proprietary codes when they are submitting gas transaction data to the pipelines.
5. Customer demand will drive further efforts to implement the use of common codes throughout the natural gas industry.

It should be noted that the WG5 consensus does not preclude the jurisdictional interstate pipelines from voluntarily agreeing to accept common codes in their communications. For example, a pipeline could offer its customers the choice of communicating with it using either the proprietary codes or the common codes.

Figure 1 presents a simplified scheme of the WG5 consensus approach. In the current environment, this consensus approach was adopted for the following reasons:

- o Customer Demand For Common Codes And Proprietary Codes: It is evident that some parties wish to use transaction point common codes, while others

wish to use proprietary codes. The consensus approach provides for pipelines and their customers to use either common codes or proprietary codes.

- o The Cost Associated With Universal Implementation: Under the consensus approach, pipelines and their customers do not have to change their computer systems, at some cost, to accommodate gas transaction communications using common codes. Only those using common codes will bear the costs of implementing common codes on their computer systems. This method places the costs for implementing common codes on the users who want the service.
- o Orderly Implementation Of Common Codes: The consensus approach allows for those who have an immediate need for common codes to gain access to a complete and verified system of codes. Others who prefer to continue using proprietary codes can do so without requiring the simultaneous use of both the common codes and proprietary codes.
- o Consistent Communication With Pipeline Customers: Working Group #5 came to the consensus that the translation between proprietary codes and common codes, if necessary, will be performed by the party prior to it submitting business transactions to the pipeline. This assures consistent communication between pipelines and their customers, because all communications through the various media (i.e., computer, phone, fax, letter) might still use proprietary codes. Without this consistency, it would be difficult for pipelines to deal with customer requests and inquiries that employ different coding systems.

FIGURE 1
Business Process

- (1) Gas business transactions between transporter and shipper may include capacity release, capacity acquisition, nominations, confirmations, billing, etc. Communications will be either EBB, file transfer/EDI, fax, mail, phone, etc.
- (2) Both purchaser and seller may be shippers, contracting and transacting business with transporters.
- (3) Sellers and purchasers who desire to use common code will contract with a distributor and will perform the translation to transporters proprietary code.
- (4) There will only be one industry sponsored code assignor. Petroleum Information Corporation (PI) will be the code assignor. PI will maintain and provide to the industry a complete database listing of all transporter's proprietary codes, the PI GRID common code and associated data.
- (5) There will be multiple code distributors. Distributors will provide to the industry the PI GRID common code database via various media and will provide options for distribution.
- (6) Transporters will provide to PI and validate with PI all gas transaction points (both logical and physical) as they are added to their system. Transporters may convert to the PI GRID common code as customer demand warrants.

C. Common Code Implementation As A Customer Driven Process

WG5 believes that customer demand for common codes will drive the industry to use, or not use, common codes. By creating common codes and a cross-reference to proprietary codes, the WG5 consensus provides the tools necessary to meet the industry's business requirements, without compelling a change to the industry's business processes. While it cannot be certain, WG5 believes that one of two things is likely to occur. Either the market participants will determine that common coding is efficient and will evolve in a way which encourages all parties to communicate through the use of common codes or, the market will decide that common codes are not essential and the integration of common codes into the industry's business processes will occur selectively. No matter what the outcome, WG5 strongly endorses the principle that it will be customer demand that determines the final result.

WG5 believes the process it has suggested for the assignment, verification and ongoing maintenance of common codes is responsive to the needs of the gas industry at this time and is likely to be flexible enough to meet new requirements. As with the recommendations made by other working groups, WG5 sees this proposal as a beginning, which will require ongoing monitoring and adjustment in order to remain responsive to the industry's needs.

III. PROCEDURES FOR CREATING TRANSACTION POINT COMMON CODES

A. Transaction Point Common Code Definition And Data Base Structure

1. Definition of a Common Code

Before discussing the procedures that will be employed for assigning transaction point common codes it would be best to review first what constitutes a common code, along with a description of the transaction point common code data base elements. Gas transaction points are defined as all points at which gas transactions take place. The types of these transactions include, but are not limited to:

- Capacity release,
- Capacity availability,
- Scheduling,
- Title transfer, and
- Custody transfer.

Transaction point common codes provide a unique common code for each proprietary code and allow market participants to identify multiple proprietary codes associated with a unique location (e.g. at an interconnect). Transaction point common codes could eventually be assigned to all natural gas transaction points from wellhead to burnertip, both physical and logical.

The transaction point common code data base suggested by WG5 establishes a cross-reference between the unique common code identifier and the proprietary gas transaction point codes. The common code/proprietary code cross-reference data base would be composed of identical record formats.

2. Characteristics of a Transaction Point Common Code and Its Associated Data Base

There will be only one common code for each unique proprietary code. For example, a pipeline interconnect would have two or more proprietary codes which will each be cross-referenced to a unique common code. However, multiple proprietary codes at the same location (e.g., at an interconnect) will be easily identifiable as their respective 16-digit common codes will each share the same first ten (10) digits. Thus, there will be a common code data base record for every unique proprietary code that each owner/operator has established and uses to facilitate natural gas transactions on their system.

Table 1 specifies the data elements that the owner/operator and Code Assigner will exchange in order to assign and verify common codes. Table 1 also specifies the data elements which the Code Assigner will transfer to the Code Distributor, and that, in turn, will be provided to Code Users, as requested. These data elements are necessary to establish the proper cross-reference between a proprietary code and the common code. In Table 1, the "status" field indicates whether the Data Provider must provide the data ("M" for mandatory), whether the data's provision is conditional on another field entry ("C" for Conditional), or whether the data is optional ("O" for optional).

Appendix #1, "Structure Of The PI GRID Common Code" elaborates on Petroleum Information's record structure for the transaction point common code.

Table 1: Data Elements Of The Gas Transaction Point Common Code Record

Field No.	Field Name	Description of Field Name	Status	Data Type and Explanation
1.	Owner/operator name	The legal name of entity that owns and/or operates the transaction point.	M	A text field provided by the owner/operator that is responsible for conducting business at the point.
2.	Owner/Operator Company Code	The company code of the entity that owns/operates the gas transaction point.	M	An alpha-numeric field containing a code that uniquely identifies the owner/operator of the point.
3.	Point code	The code assigned by the owner/operator to the transaction point.	M	An alpha-numeric field containing the point code for the gas transaction point that is used by the owner/operator.
4.	Point type indicator	An indicator for the type of facility at the point. For example, "01" could indicate an interconnect.	M	A positive integer field containing codes to identify the type of facilities located at gas transaction points. (These codes will be developed on a consensus basis between the Code Assigner and the Data Provider.)
5.	Flow indicator	An indicator to determine the direction of gas flow in the case of interconnects and storage: R=receipt or flow into the pipeline only D=delivery or flow out of the pipeline only B=both receipt and delivery	C	A single-position alpha field that would be completed only if the "Point type indicator" of the facility is either an interconnect or storage facility.
6.	Point name	The name assigned to the point by the owner/operator.	M	A text field provided by the owner/operator of the gas transaction point.
7.	State	The state in which the gas transaction point is located.	M	A text field containing the name of the state.

8.	County	The county in which the gas transaction point is located.	M	A text field containing the name of the county.
9.	Point Locator	A unique locator for the transaction point.	O	An alpha-numeric field containing the geographic coordinates, survey coordinates or pipeline line number and mile marker. This field would be completed only if the information is available.
10.	Up/downstream entity name	The name of the entity that controls capacity upstream or downstream of the point, e.g., at an interconnect.	O	A text field containing the legal name of the entity that owns/operates the facility that is either upstream or downstream from the point. This field would be completed only if the information is available.
11.	Up/downstream point name	The point name as assigned by the entity that controls capacity upstream or downstream of the gas transaction point, e.g., at an interconnect.	O	A text field provided by the owner/operator of the gas transaction point. This field would be completed only if the information is available.
12.	Up/downstream point code	The point code as assigned by the entity that controls capacity upstream or downstream of the gas transaction point, e.g., at an interconnect.	O	An alpha-numeric/numeric code assigned by the up/downstream owner/operator that uniquely defines the gas transaction point. This field would be completed only if the information is available.
13.	Joint ownership indicator	An indicator to determine if the point has joint owners: Y=yes, N=no.	M	A single-position alpha field to alert the common Code Assigner that other Data Providers might be reporting this point.
14.	Non-operator point	An indicator to determine if the point is operated by another party, other than the Data Provider: Y=yes, N=no.	M	A alpha-numeric field to indicate whether the gas transaction point is operated by a party other than Data Provider.

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15.	Point common code	A standard common code to be assigned by the Code Assignor to uniquely identify the gas transaction point.	M	A alpha-numeric field containing the common code that is assigned by the Code Assignor.
16.	Confirmation code	A code to indicate the current status of the common code. The code would be "Pending" (P) if the transaction point data is waiting for verification by the owner/operator providing the data; "Verified" (V) after the verification process has been completed; "Declined To Verify" (D) if the owner/operator has declined to verify the data; or "Rejected" (R) if the owner/operator rejects to verify the data because it is not a valid transaction point.	M	A single-position alpha field that contains either a P="Pending", V="Verified", D="Declined To Verify", or R="Rejected" to indicate the status of the common code and its data record.
17.	Date active	The date on which the transaction point becomes or became active. A default value equivalent to January, 1, 1960 would be used for all points that are currently active.	M	A date field in a format that is machine-processable. The owner/operator would use this field to notify the Code Assignor of date the data base record representing the proprietary/common code cross-reference becomes active.
18.	Date inactive	The date on which the transaction point is, will be, or became inactive. The owner/operator would use this field to notify the Code Assignor of points that will be permanently inactive on a future date. This is not intended to be used to indicate temporary closure due to such factors as maintenance.	C	A date field in a format that is machine-processable. The owner/operator would use this field to notify the Code Assignor of date the data base record representing the proprietary/common code cross-reference becomes inactive. This data element is conditional, based on whether the owner/operator changes, whether the proprietary code or name changes, whether other data elements change, or whether the point is permanently removed from service.
19.	Last update	The date on which the transaction point common code record has been changed.	M	A date field in a format that is machine-processable. The Code Assignor would use this field to indicate either when the record was created, modified, or made inactive.

3. Working Group #5's Consensus Agreement On The Assignment of Transaction Point Common Codes

WG5 has agreed on the following principles for code assignment, validation, and maintenance:

1. There will be one set of common codes and it will be owned and controlled by the natural gas industry.
2. There will be one sanctioned common Code Assignor who will be universally supported by all owner/operators in the assignment, validation, and maintenance of common code records and data elements. This should serve to maximize data integrity while minimizing costs to all parties.
3. The owner/operators of gas transaction points will proactively work with the Code Assignor to initially establish an up-to-date and verified common code for each of their proprietary gas transaction points. Then, on an ongoing basis, owner/operators will assure that all additions, deletions and changes to their proprietary gas transaction points are communicated quickly and accurately to the Code Assignor for cross-referencing and inclusion in the common code data base.
4. To minimize cost and expedite the common coding process, owner/operators will not be required to use the transaction common code in their communications of any business transactions, including EDI, on-line EBB, letters, and conversations. Owner/operators would utilize the common code in their business transactions if that is beneficial to them and their trading partners.
5. The Code Assignor will assign the common codes to gas transaction points designated by owner/operators free of charge to the owner/operator.

6. Anyone may request a common code assignment by providing the appropriate information as listed on Table 1. The Code Assigner, through communication with the owner/operator, will determine if the requested assignment is for a valid gas transaction point of the owner/operator. If it is not, a common code would still be assigned, but under no circumstances would that code be identified as being associated with an owner/operator who has indicated that the requested code assignment is not for a valid gas transaction point on its system. The owner/operator field in the common code data base record will list the company code of the requester or remain blank. Under no circumstances, would the owner/operator be required to conduct business transactions at those common code point assignments requested by outside parties.
7. The Code Assigner will assign newly requested codes as quickly as is practical and add the new record into the common code data base. If applicable, the Code Assigner would then initiate the iterative validation process.

B. Assignment Of Transaction Point Common Codes

The Data Provider must be either the owner/operator or interconnecting party of the gas transaction point for which information is being provided. The information provided must conform to the common code data base requirements defined in Table 1. If the information is designated optional, it will be provided or confirmed if the information is available to the Data Provider.

For this discussion on the assignment, validation, and modification of the common code data base, the "Code Assigner" will be spoken of in a generic context. However, keep in mind that WG5 has selected Petroleum Information Corporation as the Code Assigner. So "Petroleum Information" could be substituted everywhere "Code Assigner" is referenced.

1. Initial Assignment of Transaction Point Common Codes

For initial assignment of common codes and their cross-referencing to the proprietary owner/operator or interconnecting party gas transaction points, the steps in the process are:

1. Initially, the Code Assignor will contact Data Providers, starting with the interstate natural gas pipelines. Each of these Data Providers will specify a liaison, who will work with the Code Assignor in developing the common code data base information specified in Table 1. The Code Assignor and each Data Provider will develop a mutually acceptable schedule for developing the common code data base. (Even though multiple Data Providers can work with the Code Assignor simultaneously, it would be an unreasonable resource burden on the Code Assignor to simultaneously develop the common code data base for all Data Providers. Thus, the initial assignment process will proceed in stages to sequentially develop common codes for all Data Providers.)
2. Each Data Provider and the Code Assignor will mutually determine the media to be used to communicate the proprietary codes and related information to the Code Assignor. All attempts will be made to use electronic media, to avoid re-keying of information.
3. Prior to submitting the data to the Code Assignor, the Data Provider must contact interconnecting parties for their proprietary gas transaction point codes to verify that the codes and the related information to be submitted are correct.
4. The Code Assignor will receive the proprietary gas transaction point codes and related data elements, as defined in Table 1, from the Data Providers.
5. The Code Assignor will return a list of the submitted proprietary gas transaction point codes and related information with the common code assignment to the Data Provider for validation. (See validation process for

more information.) The Code Assignor will identify any apparent discrepancies or errors in the submitted data for the Data Provider to resolve.

6. The Code Assignor and the Data Provider will work together to resolve any apparent discrepancies or errors within the common code data base. The Data Provider will not be responsible for resolving any discrepancies or errors resulting from data submitted by other parties. (See validation process for additional information.)
7. The Code Assignor will provide the initial version of the common code data base to Code Distributors, once the data verification process has been substantially completed for a given Data Provider. Code Distributors, in turn, will disseminate the initial data base to Code Users on a timely basis.

2. The Ongoing Assignment Of Transaction Point Common Codes

The steps in this process are:

1. The Data Provider will be responsible for obtaining from the appropriate interconnecting parties their gas transaction point codes in order to verify that their proprietary codes and the related information are correct relative to the information to be submitted by the Data Provider.
2. The Data Provider will provide the new proprietary gas transaction point codes and the related information, as defined in Table 1, to the Code Assignor. This request for a new code assignment must be provided at least ten days prior to any business transactions occurring that will require the use of the new proprietary code.
3. The Code Assignor will ensure that the new assignment is given the appropriate priority, so that the Code Assignor will have completed its work before the date in which the new codes must go into effect.

4. The Code Assignor will return a list of the submitted proprietary gas transaction point codes and related information with the common code assignment to the Data Provider for validation. (See validation process.) In this list, any apparent discrepancies or errors, which resulted from the data submitted by the Data Provider, will be noted.
5. The Code Assignor and the Data Provider will work together to resolve any discrepancies or errors resulting from information provided by the Data Provider. The Data Provider will not be responsible for resolving any discrepancies or errors resulting from data submitted by other parties.
6. The Code Assignor will provide an updated version of the common code data base to Code Distributors on a timely basis, once the verification process has been completed and well in advance of the date on which the new code goes into effect. Code Distributors, in turn, will disseminate the revised data base to Code Users in sufficient time before the new codes go into effect.

3. Corrections And Modifications Of The Data Related To Already Assigned Common Codes

Corrections to the common code and its associated data base will be implemented as they are brought to the Code Assignor's attention.

Aside from corrections to the code's existing data elements, a common code data base record could be modified for one of the following reasons: 1) there has been a change in the facility's ownership or operator, 2) the facility "type" has changed (e.g., due to new investments), 3) the facility has been permanently removed from service, 4) new proprietary codes and/or names have been assigned to existing transaction points, and 5) the location of the transaction point has been moved either upstream or downstream on the system. Unlike corrections, modifications of an existing record will usually create an inactive record which would be archived in a historical data base. The historical data base would be available to all Code Distributors for use by Code Users who wish to determine the prior characteristics associated with a particular transaction point common code.

The steps in this process are:

1. The Data Provider will be responsible for contacting interconnecting parties, if applicable, for obtaining their proprietary point codes and related information in order to verify that the modifications to be submitted are correct.
2. The Data Provider will provide the corrections, modifications, and related information to the Code Assignor. This information shall include the cross-referenced common code which has already been assigned. The Data Provider will also specify the date in which the modifications go into effect. A minimum of ten working days of notice will be required before a modified proprietary code goes into effect. Corrections will be implemented as quickly as is possible.
3. The Code Assignor will return a list of the data base records, as modified, along with the prior common code records to the Data Provider for validation. (See validation process).
4. The Code Assignor and the Data Provider will work together to resolve any apparent discrepancies or errors in the proprietary gas transaction point code and related information. The Data Provider will not be responsible for resolving any discrepancies or errors resulting from data submitted by other parties. (See validation process).
5. The Code Assignor will provide an updated version of the common code data base to Code Distributors on a timely basis, following verification and well in advance of the date on which the record modifications goes into effect. Code Distributors, in turn, will disseminate the revised data base to Code Users in sufficient time before the record modifications go into effect.

C. Validation Of Assigned Codes

A Data Provider is obligated to validate only information which was submitted by that Data Provider. However, the Data Provider will contact any interconnecting parties to ensure consistency in the information submitted to the Code Assignor. Optional data fields will be validated by the Data Provider if the information is available to the Data Provider. Validation and subsequent approval of the information can only be made by the Data Provider, i.e., the owner/operator or interconnecting party of the gas transaction point.

1. Initial Validation Of Common Codes

The steps in this process are:

1. The Code Assignor will return a list of the submitted proprietary gas transaction point codes and related information with the newly assigned common code.
2. The Code Assignor and the Data Provider can work together to resolve any discrepancies within the proprietary gas transaction point code and related information provided by the Data Provider. The Data provider will not be responsible for resolving data discrepancies which did not result from the information submitted by that Data Provider.
3. If the discrepancy exists between the Data Provider and interconnecting parties, the Code Assignor informs the Data Provider and the Data Provider will resolve the discrepancy with the interconnecting parties directly. The Data Provider will then inform the Code Assignor of the correct information.
4. Once all discrepancies regarding the submitted data are resolved for a given point, the Data Provider indicates in writing to the Code Assignor that the

information is valid, and the status of the information is changed from "Pending" to "Verified".¹

5. A final report will be distributed to the Data Provider with the information that was submitted, the associated common code, and its status.

2. Subsequent Validations

For additional new codes, modifications or corrections of information on existing codes, or changes in status of active/inactive common codes, the validation steps to follow in the process are:

1. The Code Assignor will return a list of the submitted proprietary gas transaction point codes and related information with the newly assigned common code and all related information.
2. The Code Assignor and the Data Provider will work together to resolve any discrepancies within the proprietary gas transaction point code and related information provided by the Data Provider. Neither the Data Provider nor the interconnecting party will be responsible for resolving data discrepancies submitted by other parties.
3. If the discrepancy exists between the Data Provider and interconnecting parties, the Code Assignor informs the Data Provider and the Data Provider will resolve the discrepancy with the interconnecting parties directly. The Data Provider will then inform the Code Assignor of the correct information.
4. Once all discrepancies regarding the submitted data are resolved for a given point, the Data Provider indicates in writing to the Code Assignor that the

¹ Note that a Data Provider could either 1) decide not to verify the information, so the status would be "Declined To Verify"; or 2) declare that the location does not constitute a valid gas transaction point, so the status would be "Rejected".

information is valid, and the status of the new codes is changed from "Pending" to either "Verified", "Rejected", or "Declined To Verify". (See Footnote #1.)

5. A final report will be distributed to the Data Provider with the information that was submitted, the associated common code, and its status.

D. Reports

Copies of the final reports cited in Sections III.C.1.5 and III.C.2.5 will be sent by the Code Assignor to the gas industry consortium (as defined below) that is contracted with the Code Assignor on the gas industry's behalf.

IV. TRANSACTION POINT COMMON CODE IMPLEMENTATION & SCHEDULE

In order to make common codes available to the marketplace as early as possible, the creation and validation of common codes will be accomplished in a phased, sequential manner. As a consequence, PI will coordinate with gas transaction point owners/operators to establish common code implementation schedules. In order to achieve implementation a number of steps must be undertaken, including: 1) establishing a Data Provider liaison to work with the Code Assignor, 2) establishing a time schedule for common code development and implementation, 3) specifying the number of transaction points for which common codes must be created, 4) sending the initial set of proprietary codes, 5) assignment of common codes, 6) resolving discrepancies and 7) validating common codes.

Initial discussions with PI indicate that approximately six months of effort will be required to establish and validate the common codes for a large majority of interstate pipeline points. Thus, if the gas industry begins the coding effort this winter, one could reasonably expect the creation of a common code data base for the major interstate gas pipelines being finished by the 1994-1995 winter heating season.²

Once the transaction point common codes have been developed for all the jurisdictional interstate natural gas pipelines, the Code Assignor will solicit the cooperation of the intrastate gas pipelines, local gas utilities, gas gatherers, and gas processors. The development of non-jurisdictional transaction point common codes will be strictly voluntary. This voluntary process is intended to eventually create a common code for every transaction point within the entire national gas grid.³

² Some pipelines have already begun the process of cross-referencing their proprietary codes with the PI GRID Code.

³ Petroleum Information will create common codes for all non-jurisdictional transaction point brought to their attention. However, unless the owner/operator "validates" the common code record, the Confirmation Flag (i.e., data element #15 in Table 1.) would indicate that the data record had not been validated. Even without the owner/operator's validation of the record, the assignment of a non-validated common code to a transaction point could be useful to parties conducting business at that transaction point (e.g., for internal accounting).

Working Group #5 recommends that within 30 days of the final Commission Order in Docket No. RM93-4-000, in which the Commission endorses this WG5 recommendation, all pipelines under the jurisdiction of the Commission will provide Petroleum Information Corporation with the name of a liaison person to coordinate activities between the pipeline and Petroleum Information. WG5 recommends that as many jurisdictional pipeline common codes be created and validated for as many transaction points as possible for the 1994-1995 winter heating season. Petroleum Information has agreed to issue monthly status reports to the gas industry consortium identified in the licensing agreement with PI, beginning December 1, 1993.

V. INSTITUTIONAL ARRANGEMENTS

A. Institutional Responsibilities With Respect To The Development And Distribution Of Transaction Point Common Codes

1. The Code Assignor

The Code Assignor will be responsible for following the protocols discussed in Section III concerning the procedures for developing, validating, and maintaining the common code data base. Moreover, the Code Assignor will be required to provide a one-time copy of the entire common code data base structure to any parties requesting the data base. However, the Code Assignor will not be responsible to Code Users either for providing periodic updates to the data base nor for providing selected records out of the entire data base. In addition to being a Code Assignor, the Petroleum Information Corporation has agreed to be a Code Distributor.

The Code Assignor will ensure that the set of cross-referenced common codes and proprietary gas transaction point codes and associated information, as specified in Table 1, correctly corresponds to the data that the interconnecting party or owner/operator of the point provided and validated. The Code Assignor will be responsible for expeditiously correcting any errors brought to their attention. The Code Assignor, however, will not be required to warrant that the information is "correct" as measured against an objective or other standard.

The common code data base will be distributed to any requester. None of the information in the cross reference tables is viewed as confidential, so all information will be in the public domain.

The Code Assignor will provide the entire data base to any requestor at a cost based on the personnel time and materials needed to ship the data to the other party. (The Code Assignor cost is meant to cover "postage and handling" costs and not to cover any of the cost incurred by the Code Assignor in developing the common code data base.)

At the meeting held on August 23-24, WG5 selected the Petroleum Information Corporation as the transaction point common code assignor. Petroleum Information Corporation's corporate headquarters is located at 5333 Westheimer Road, Houston, Texas, 77056. Their telephone number is 713/840-8282. The Petroleum Information Corporation liaison concerning transaction point common codes is Mr. Richard M. Tucker.

Petroleum Information ("PI") was founded in 1928 and employs about 600 people worldwide. PI has been assigning PI GRID Codes to gas industry facilities for the last five years. Over this period about 100,000 transaction point codes have been assigned.

2. Code Distributors

Code User access to the common code data base will be primarily through a common code data base distributor (except for the one-time provision of the entire data base to any requestor, as discussed earlier).⁴ A Code Distributor would enter into a service agreement with a Code User which would specify both the frequency of data base updates, the media for transferring the data, and any other services provided by the Distributor such as the selective extraction of information from the data base pertaining to a particular set of trading partner common codes. The cost of providing these services, however, will be based on "value added" and there will be no charge for the underlying common code data.

Code Distributors will ensure that the set of cross-referenced common codes and proprietary gas transaction point codes and associated information are distributed timely, correctly, and corresponds to the data that the Code Assignor provided and validated. The Code Distributors, however, will not be required to warrant that the information is "correct" as measured against an objective or other standard.

⁴ While any gas market participant can provide anyone else with a copy of the common code data base, "Code Distributor" refers to a party entering into a formal contract with the Code Assignor to receive and disseminate the common code data base.

Several institutions have expressed an interest in becoming Code Distributors, including: 1) the American Petroleum Institute, 2) the National Registry Of Capacity Rights, 3) Dwight's EnergyData, Inc., 4) Logistic Solutions, Inc., 5) Enernet, and 6) ISSC, Inc. There is no limitation as to the number of institutions which can become Code Distributors.

B. Contractual Arrangements With Respect To Transaction Point Common Codes

Three types of formal contractual arrangements are envisioned with respect to transaction point common codes. These contractual arrangements will have to exist for the following parties:

- between the Code Assignor and a group that represents a large segment of the gas industry (hereinafter referred to as the "Gas Industry"),
- between the Code Assignor and Code Distributors, and
- between a Code Distributor and Code User.

1. Contractual Arrangements Between The Gas Industry And The Code Assignor

A contract will be necessary between the Code Assignor and the Gas Industry for the following reasons:

1. To protect gas industry access to a copyrighted business product of the Code Assignor,
2. To specify the responsibilities of the Code Assignor,
3. To specify the conditions under which the Gas Industry would be entitled to replace the Code Assignor, and

4. To protect the Code Assignor from financial liability claims resulting from data base errors.⁵

Rights and ownership of the common code and its cross-reference to proprietary gas transaction point codes (the common code data base) would be retained by the Gas Industry through a contract either with a consortium of the major gas trade associations or ultimately with a gas industry standards board ("GISB"). Should the Code Assignor, for any reason, not continue to be the sanctioned Code Assignor, the rights to use, update, assign and distribute the common code and the common code data base would remain with the Gas Industry.

Over the long run, WG5 sees a gas industry standards board as the party eventually representing the gas industry in the contract between the Code Assignor and the entire gas industry. However, given that a GISB does not currently exist, WG5 has endorsed the concept of having one or more of the major natural gas trade associations band together to collectively sign a licensing agreement with the Code Assignor. Both the Interstate Natural Gas Association Of America and the Natural Gas Supply Association have expressed an interest in becoming parties to the PI contract.⁶ Other gas trade associations will be solicited to see if they also wish to be signatories to the contract.

In the event that a GISB is not founded, the gas trade associations will continue to be signatories to the contract with the present or future Code Assignor. If GISB is founded, the contract with the trade associations will stipulate the circumstances under which the contract would be assigned to the GISB.

2. Contracts Between The Code Assignor And The Code Distributors

These contracts are basically service arrangements that will stipulate the terms and conditions associated with transferring the common code data base to the Code Distributor. One

⁵ Because the information contained in the data base will be provided by other parties, it was deemed inappropriate to hold the Code Assignor financially responsible for any data base errors.

⁶ Both INGAA and NGSA will need to fully review the final contract provisions for legal and anti-trust issues before a contract is signed.

stipulation in the contract will be that the Code Distributor will not be allowed to charge for the code itself. The Code Distributor, however, will be able to charge for any "value-added" services they provide to Code Users.

3. Contracts Between Code Distributors And Code Users

As in the prior instance, the contract between a Code Distributor and a Code User will constitute a service agreement that stipulates the terms and conditions of the services provided to a Code User. This contract, for example, could require the Code Distributor to sort through the master common code data base in order to extract only those common codes required by a Code User to conduct gas transactions. The contract would also stipulate the frequency at which a Code User's common code data base is updated.

VI. ADDITIONAL ISSUES

A. Definition of Customer Demand

Working Group #5 believes that customer demand should determine if and when pipelines utilize and support common codes for gas transaction points (PI GRID). The working group's recommendations included in this report represent a consensus on what is appropriate at this point in time. However, customer desires may change over time, and Working Group #5 has not addressed the specifics of how future changes in customer demand might affect the future implementation of common codes. Nor has the group addressed the issue of what process should be followed to determine when common codes would be used to communicate with pipelines.

This issue is a generic one which is common to all the other EBB Working Groups as well. Consequently, the issue of what constitutes "sufficient" customer demand for new pipeline services needs to be addressed by all the Working Groups rather than being solely a Working Group #5 issue. This generic issue can be delineated into the following questions: A) "Who are the pipelines' customers?", B) "What level of customer demand is sufficient for an interstate pipeline to offer a new service being requested of that pipeline?", and C) "What is the decision process for resolving the first two questions?" The Working Groups will continue to address this issue in upcoming meetings and will report to the Commission on their progress in resolving this issue, in their February 1, 1994 reports.

VII. RECOMMENDATIONS & CONCLUSIONS

The primary consensus recommendations of EBB Working Group #5 regarding transaction point common codes are as follows:

1. **Petroleum Information Corporation of Houston, Texas has been selected by WG5 to be the gas industry's transaction point common code assignor. PI GRID Code has also been selected to be the gas industry's common coding system for identifying gas transaction points.**
2. **Common Code Users will contract with PI or other authorized Code Distributors for update services for the common code. With the exception of the fees imposed for distribution handling and for the provision of other "value added" services, the common code data base will be provided at no cost to code users.**
3. **Gas transaction point owner/operators will provide and validate the proprietary code information submitted to the Code Assignor (i.e., Petroleum Information Corp.) which is necessary for the creation of a transaction point common code data base.**
4. **Gas transaction point owner/operators may continue to use their proprietary codes for communicating information on business transactions.**
5. **Customer demand will drive further efforts to communicate using common codes throughout the natural gas industry.**
6. **Working Group #5 recommends that within 30 days of the final Commission Order in Docket No. RM93-4-000, in which the Commission endorses these**

recommendations, all pipelines under Commission jurisdiction will provide Petroleum Information Corporation with the name of a liaison person to coordinate activities between the jurisdictional pipelines and PI.

Respectfully submitted:

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APPENDIX 1

PI GRID CODE STRUCTURE

The PI GRID Code uniquely identifies each transactionally significant facility -- wellhead to burner tip -- in the natural gas business. These facilities include physical facilities such as wellheads, interconnects, entry points, gas plants, compressors, exchange points, points of delivery to local distribution companies and end users, storage facilities, etc. These facilities also include logical (non-physical) ones such as pool points. The pipeline nomination code associated with each of these facilities has been identified and cross-referenced to the corresponding PI GRID Code. The purpose of this paper is to provide background information regarding the unique coding structure of the PI GRID Code and to address legitimate industry concerns regarding adoption of the PI GRID Code as the industry common code for referencing facilities.

The following provides a brief introduction to the PI GRID Code Structure currently used for coding natural gas industry facilities. This same structure is also adaptable for use in coding crude petroleum upstream facilities/locations. Since the PI GRID Code Structure is modeled after the API Well Number structure, a comparison of the two is included. Specific examples of codes for each facility type are available from Petroleum Information upon request.

The code structure entails the use of 16 digits. The use of these digits for a non-well facility are defined below.

PI GRID (NON-WELL FACILITY) CODE

State Code	County Code	Location Code	Facility Code	Sub Number	Detail Number
42	201	A2151	03	01	01

The first two digits (state code) contain a code for the state or pseudo-state. The API maintains a table containing codes for both onshore and offshore United States, Canada and Mexico.

The next three digits (county code) contain a code for the county or pseudo-county. The API maintains a table of onshore county codes (including parish codes for Louisiana and USGS quadrangles for Alaska) and pseudo-county codes for offshore waters.

The next five digits (location code) are random but unique for a given surface location within the state/county. Therefore, if a gas plant and a compressor exist at a given location, each will share the same location code, e.g. A2151. All non-well facilities employ an alpha character in the first digit of the location code, whereas for wells all 5 digits consist of numeric characters. The combination of an alpha character with numeric characters for non-well facilities is done to ensure that their PI GRID Codes are never duplicative of a well's code. As described below, PI GRID Codes for wells incorporate the well's API Number. Whereas PI assigns non-well PI GRID Codes, PI does not assign API Numbers (and hence the first ten digits of PI GRID Codes for wells).

The relationship between an API Number for a well and the PI GRID Code for that same well is shown below:

API WELL NUMBER

State Code	County Code	Unique Code	Side- Track	Hole Change
42	135	12345	01	00

PI GRID (WELL COMPLETION) CODE

State Code	County Code	Unique Code	Facility Code	Side- Track	Completion Code
42	135	12345	77	01	01

The first ten digits are identical. The PI GRID Code includes a 2-digit facility code (77) after the API Number's Unique Code and before the Side Track. The Side Track is the same in the two codes. The PI GRID Code includes in the last 2 digits a **Completion Code**, rather than the Hole Change Code used in the API Well Number. In fact, both the Completion Code and the Hole Change Code are assigned by PI. Officially the API is a 12 digit code. However, due to common usage by the industry, many people consider the Hole Change to be part of the API Number.

The eleventh and twelfth digits of a PI GRID code represent the type of facility (facility code). A distinct number has been assigned for each type of facility, e.g. wells, pipeline interconnects, gas plants, etc.

The last four digits of a non-well PI GRID Code are available for distinguishing multiple facilities of a given type (e.g. interconnects) at the same location and/or for representing facility components of importance to the industry. The first two of these four digits (sub number) are generally used to further distinguish components of certain types of facilities (for example to distinguish gas plant inlets from gas plant tailgates). The last two of these four digits (detail number) are used for distinguishing multiple facilities of the same type at the same location. For example, many gas plants have multiple pipeline tailgates, and each needs to be coded uniquely.

For each non-well facility coded, PI provides the following descriptive data items with the PI GRID Code:

- State Name Abbreviation
- County Name
- Facility Type
- Facility Operator
- Operator's Facility Name
- Meter Number (Operator's Facility Code)
- Connecting Party (if relevant, e.g. for interconnects)
- Additional descriptive text about the facility (if any)

For each active gas well completion coded, PI provides the following descriptive data items with the PI GRID Code:

- State Name Abbreviation
- County Name
- Well Name
- Well Number
- Regulatory Code
- Operator Code and Name
- Field Code and Name
- Reservoir Code and Name

Table 1 below lists both the natural gas facilities which have already been assigned two-digit facility codes and proposed facility codes for the future coding of crude petroleum upstream facilities (marked with an asterisk). Note that the facilities marked with double asterisks are

common to gas and crude. One of the advantages of the PI GRID Code is that it is able to serve the common code needs of the entire petroleum industry, not just those of the natural gas pipeline segment of this industry.

TABLE 1. PI GRID FACILITY CODES

	03	Interconnect Between Gas Pipelines
•	04	Interconnect Between Crude Pipelines
••	05	Gas Plant
•	06	Crude Refinery
	07	Gas Compressor
•	08	Crude Pump Station
	09	Gas Exchange Point
	11	Gas Pipeline Entry Point
•	12	Crude Pipeline Lease Entry Point
••	13	Offshore Production Platform
	15	Gas Storage Facility
•	16	Crude Pipeline Storage Facility
	17	Gas Pipeline Delivery Facility to Distribution Network
	19	LNG Terminal
•	20	Crude Import Terminal
	21	Gas Pipeline Delivery Facility to End User
	29	Pool Point
••	77	Well
	88	Stand Alone Gas Measurement Station
••	99	Map Point
•	<i>Facilities related to crude only</i>	
••	<i>Facilities related to crude and gas</i>	

CODE ASSIGNOR AGREEMENT

THIS AGREEMENT is entered into effective this ____ day of _____, 1993 by and between Petroleum Information Corporation, a Delaware corporation (PI), and the Natural Gas Supply Association, a Trade Association (NGSA), and the Interstate Natural Gas Association of America, a Trade Association (INGAA), the two Trade Associations acting jointly, and herein after referred to as the "Gas Industry," as temporary surrogates for all parties in the natural gas market who may want to electronically communicate with trading partners utilizing common codes for natural gas transaction points.

This Code Assignor Agreement specifically references the PI GRID Codes Digital File Delivery License Agreement (Code Distributor Agreement) and incorporates that agreement and all appendices to it herein by reference.

It is contemplated that the Federal Energy Regulatory Commission (the Commission) that issued the Notice of Proposed Rulemaking which was promulgated on July 29, 1993 in Docket No. RM93-4-00 -- Standards for Electronic Bulletin Boards Required under Part 284 of the Commission's Regulations, may wish to join in this Agreement. If such is the case, PI, NGSA and INGAA will reach an understanding with the Commission as to any conditions that the Commission places upon its execution hereof and under what circumstances the Commission has determined to provide its execution.

For good and valuable consideration and in consideration of mutual covenants hereinafter set forth, the parties to this Agreement hereby agree:

1. PI has developed and owns the PI GRID Common Code Database (PI GRID Codes) which serve as identification codes for natural gas facilities, locations and points generally referred to as gas transaction points ("Gas Transaction Points").
2. Definitions for terms used herein include the following:

Code Assignor - means PI who has been selected by the Gas Industry to be the one Code Assignor. PI will maintain and provide to the Gas Industry a complete database listing of all Transporter's proprietary codes and the PI GRID Common Code and associated records.

Distributors - mean the multiple distributors who provide to members of the general public the PI GRID Codes via various media, without charge for the PI GRID Codes themselves, whether on an ad hoc or on a scheduled basis and provide options for a full database listing or only recent updates.

Users - mean Purchasers, Sellers, Operators, Shippers and Transporters as follows:

Purchaser is any party who desires to purchase gas. This includes, but is not limited to, the consumer. A consumer is a category of purchaser who owns the facilities where natural gas is consumed.

Seller is any party who desires to sell natural gas. This includes, but is not limited to, the producer. A producer is a category of seller who owns the reserves or the facilities producing natural gas.

Operator is the designated party responsible for coordinating the activities of multiple parties utilizing a physical facility 1) in which two or more owners have an interest or interconnecting facilities or 2) which is the interconnection between facilities owned by at least two different entities.

Shipper is the party who has contracted with the transporter to move gas across the transporter's facilities.

3. Institutional Arrangements for this project are set forth in Section V of the "FERC EBB Working Group #5 Final Recommendations Concerning Transaction Point Common Codes," a copy of which is set forth in Exhibit A attached to this Agreement and incorporated herein by reference. Subsequent changes to Section V by the Commission or the Gas Industry from time to time are also to be effective and considered a part hereof.
4. PI, as Code Assignor, shall provide maintenance of the database so long as PI is a party to the Agreement. Required maintenance is set forth in paragraphs 3 and 4 on pages 20-22 of Section III of the "FERC EBB Working Group #5 Final Recommendations Concerning Transaction Point Common Codes," a copy of which is set forth in Exhibit B attached to this Agreement and incorporated herein by reference. Subsequent changes to Section III by the Commission or the Gas Industry from time to time are also to be effective and considered a part hereof.
5. PI hereby grants to the parties to this Agreement, including those parties who with the consent of PI (which consent will not be unreasonably withheld or delayed) join in this Agreement after the effective date as set forth above, the non-exclusive right and license to use, reproduce, and distribute, by sale or otherwise, the PI GRID Codes in any format or media of its choosing. Such parties may include the PI GRID Codes as part of any database created or yet to be created. The PI GRID Codes and associated data are copyrighted by PI; however, the parties hereto shall have the right hereunder to use the copyrighted PI GRID Codes or reference data in any manner consistent with the purposes of this Agreement, including the basis for the development of any database.
6. The parties hereto agree that PI shall be the entity selected as Code Assignor responsible for assigning the PI GRID Codes and maintaining translation tables between the PI GRID Codes and proprietary codes. The PI GRID Codes will be made available by PI to all Users at a nominal charge to cover shipping and

handling expenses, such handling costs however, not to exceed the cost of data media plus \$25.00 per calendar year. The PI GRID Codes can be obtained from PI directly or from a number of Distributors who will be allowed to distribute the PI GRID Codes and translation tables at a nominal charge also. PI agrees to distribute the PI GRID Codes and associated descriptions for all Gas Industry Gas Transaction Points available to PI plus associated translation tables, proprietary codes, and fields of information contained in Appendix A (as such Appendix A is modified by the Commission or the Gas Industry from time to time) ("Common Code Database") to all Code Distributors in a fair and non-discriminatory manner. PI further agrees to distribute the same in a timely manner, well in advance of the date(s) a code goes into effect, and well in advance of the dates a code will be required for a gas industry transaction of a User. PI further agrees it will make the Common Code Database available to all Distributors at the same time so as not to favor any Distributor(s) over any other Distributor(s). All Distributors will receive the Common Code Database as early as possible, but in any case, before the Common Code Database is released by PI to Users. The above clause refers to the initial, ongoing, corrected and modified Common Code Database(s). In consideration of the above, Distributors agree to pay PI a \$250.00 fee per year.

7. PI AND EACH PARTY TO THIS AGREEMENT MAKE NO WARRANTY OR REPRESENTATION, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE PI GRID CODES, INCLUDING THEIR QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER PI NOR ANY PARTY HERETO WARRANT THAT THE PI GRID CODES WILL BE FURNISHED OR WILL OPERATE IN AN ERROR-FREE MANNER. ALL SUCH WARRANTIES ARE EXPRESSLY AND SPECIFICALLY DISCLAIMED.
8. IN NO EVENT AND UNDER NO CIRCUMSTANCES SHALL PI OR ANY PARTY HERETO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, EXEMPLARY OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PI GRID CODES, even if advised of the possibility of such damages. Specifically, PI and all parties hereto are not responsible for any costs, including but not limited to, those incurred as a result of lost profits or revenue, loss of use of the computer program, loss of data, the cost of recovering such programs or data, the cost of any substitute program, claims by third parties, or any similar costs.
9. The initial term of this Agreement is three (3) years from the date of execution. The Agreement will renew automatically for successive one (1) year terms if not otherwise terminated as provided herein. PI and/or any of the other parties hereto may terminate this Agreement without cause at the end of any one (1) year term by furnishing 30 days prior written notice to PI or all the other parties.
10. The parties agree that PI shall endeavor to provide an accurate Common Code Database in the initial assignment, as well as ongoing, corrected, and modified

Common Code Database(s). No warranties being offered by PI, the parties agree that PI shall be bound by the following performance standards:

1) PI shall respond and correct errors on a 24 hour or less turn-around time basis. The 24 hour turn-around time period shall commence at 8:00 a.m. (Houston, TX local time) of the business day next following the day such error(s) are brought to PI's attention, and,

2) PI shall have a cumulative error rate of less than 2% for the total of all records per calendar year.

The above clause refers to the initial, ongoing, corrected and modified Common Code Database(s). A breach of any performance standard shall be grounds for immediate termination of this Agreement. Repeated breaches of performance standards will act as an automatic termination of this Agreement.

11. Common Codes requested by third parties which are not validated as Gas Transaction Points by the owner/operator of the facility to which the requested code corresponds will be charged by the Code Assignor according to the following fee schedule for assignment of such non-validated points;

If supplied on disk, \$75.00 (seventy-five dollars) flat fee plus \$0.10 (ten cents) per code; or,

if supplied by facsimile or other "hardcopy" media, a total fee of \$10.00 (ten dollars) per code.

A Gas Transaction Point shall be deemed non validated (and the charge set forth above shall become due) if, after 90 days of the date of PI's assignment and distribution of such Common Code Gas Transaction Point along with the Common Code Database, such point or points have not been verified by the subject owner or operator.

12. A written and digital copy of any validated Common Code Database (as validated per Section III(C) of the "FERC EBB Working Group #5 Final Recommendations Concerning Transaction Point Common Codes," a copy of which is set forth in Exhibit C attached to this Agreement and incorporated herein by reference) shall be delivered to the Gas Industry for safekeeping. Subsequent changes to Section III by the Commission or the Gas Industry from time to time are also to be effective and considered a part hereof.

13. Notice provisions of this Agreement shall be provided to the following parties:

If to PI: Contact Name: _____
 Contact Address: _____
 Contact Address: _____
 Contact Telephone: _____
 Contact Facsimile: _____

If to the Gas
Industry: Contact Name: _____
 Contact Address: _____
 Contact Address: _____
 Contact Telephone: _____
 Contact Facsimile: _____

14. If this Agreement is terminated for any reason, codes that have been assigned, permanently retired or which reside in a historical database along with all other codes assigned using the PI GRID Common Code methodology and the right to assign future codes to Gas Transaction Points by means of the same methodology used by PI, shall revert to and become the property of the Gas Industry.
15. PI shall not assign or subcontract its rights and responsibilities herein.
16. Nothing herein shall be construed to place the parties in a relationship of partners or joint venturers or agent of the other, and no party shall have power to obligate or bind the other in any manner whatsoever.
17. The parties hereto agree to cooperate using commercially reasonable efforts to accomplish "FERC EBB Working Group #5 Final Recommendations Concerning Transaction Point Common Codes."

IN WITNESS WHEREOF, the parties hereto have signed and cause this Agreement to be executed on the dates stated below to be effective on the date first stated above.

Natural Gas Supply Association

By: _____

Name: _____

Title: _____

This ____ day of _____, 19__

Petroleum Information Corporation

By: _____

Name: _____

Title: _____

This ____ day of _____, 19__

**Interstate Natural Gas
Association of America**

By: _____

Name: _____

Title: _____

This ____ day of _____, 19__

The following parties have elected to join in this Agreement and have obtained the consent of PI, NGSA and INGAA:

Consent
Initials Federal Energy Regulatory
Commission

Consent
Initials

PI By: _____
NGSA Name: _____
INGAA Title: _____
This ____ day of _____, 1993.

PI By: _____
NGSA Name: _____
INGAA Title: _____
This ____ day of _____, 1993.

Consent
Initials

Consent
Initials

PI By: _____
NGSA Name: _____
INGAA Title: _____
This ____ day of _____, 1993.

PI By: _____
NGSA Name: _____
INGAA Title: _____
This ____ day of _____, 1993.

Consent
Initials

Consent
Initials

PI By: _____
NGSA Name: _____
INGAA Title: _____
This ____ day of _____, 1993.

PI By: _____
NGSA Name: _____
INGAA Title: _____
This ____ day of _____, 1993.

CODE DISTRIBUTOR AGREEMENT

LICENSE AGREEMENT PI GRID CODES: DIGITAL FILE DELIVERY

This Code Distributor Agreement (the "Agreement") is entered into this _____ day of _____, 1993 by and between Petroleum Information Corporation, a Delaware corporation ("PI") and _____ ("Customer").

This License Agreement specifically references the Code Assignor Agreement and incorporates that agreement and its appendices herein by reference. Any terms not defined in this Code Distributor Agreement shall be construed as defined in the Code Assignor Agreement.

PI agrees to provide Customer on a non-exclusive basis, the PI GRID Codes and associated data as described below for a twelve month term ("Annual Term") commencing _____, 1993 ("Commencement Date") with subsequent annual terms thereafter at the request of Customer. Three months prior to the end of each annual term, PI will notify Customer of the fee to be effective the next annual term, such fee however, not to exceed the cost of media plus \$25.00 per year ("Delivery Fee"). Customer will have until one month prior to the end of each annual term to notify PI of its intent to discontinue service as of the end of that annual term. If Customer fails to notify PI, Customer will automatically renew service for a subsequent additional annual term. The delivery fee will be invoiced at the beginning of the initial term and each subsequent annual term thereafter. The Delivery Fee shall be due upon Customer's receipt of invoice from PI.

PI will deliver on no less than a monthly basis, and if on a monthly basis, on the 15'th of each month an ASCII flat file of the PI GRID Codes and associated descriptions (a "Delivery") for Gas Industry Gas Transaction Points and all translation tables and information set forth in Appendix A as same may be modified from time to time by the Gas Industry (the "Common Code Database"). The internal format of the ASCII file supplied will be standardized and this format will not change from Delivery to Delivery. Code Distributor will be able to be utilize this file for spreadsheet and database software products and services. Code Distributor is authorized to re-distribute all or part of the Common Code Database to its customers provided that the Code Distributor does not charge for the PI GRID Codes or the use of the Codes. Code Distributor may charge for value added products or services employing, operating on or otherwise utilizing the Common Code Database.

PI agrees to distribute the Common Code Database to all Code Distributors in a fair and non-discriminatory manner. PI further agrees to distribute the same in a timely manner, well in advance of the date a code goes into effect, and well in advance of the dates a code will be required for a gas industry transaction of a USER. PI further agrees it will make the Common Code Database available to all Distributors at the same time so as not to favor any Distributor(s) over any other Distributor(s). All Distributors will receive the

Common Code Database as early as possible, but in any case, before the Common Code Database is released by PI to USERS. The above clause refers to the initial, ongoing, corrected and modified Common Code Database(s). In consideration of the above code, Distributors agree to pay PI a \$250.00 fee per year.

The PI GRID Codes and associated data are copyrighted by PI; however, the parties hereto shall have the right hereunder to use the copyrighted PI GRID Codes or reference data in any way it sees fit from the date of this Agreement and forever thereafter, including any use for resale or the development of any database or other services. PI does not make any warranties as to its accuracy and other than otherwise set forth in the Code Assignor Agreement and as between the parties hereto, PI will not be held liable in any way for any problems that may arise from the use of this Common Code Database.

The parties agree that PI shall endeavor to provide an accurate Common Code Database in the initial assignment, as well as ongoing, corrected, and modified Common Code Database(s). No warranties being offered by PI, the parties agree that PI shall be bound by the following performance standards:

1) PI shall respond and correct errors on a 24 hour or less turn-around time basis. The 24 hour turn-around time period shall commence at 8:00 a.m. (Houston, TX local time) of the business day next following the day such error(s) are brought to PI's attention, and,

2) PI shall have a cumulative error rate of less than 2% for the total of all records per calendar year.

The above clause refers to the initial, ongoing, corrected and modified Common Code Database(s). A breach of any performance standard shall be grounds for immediate termination of this Agreement. Repeated breaches of performance standards will act as an automatic termination of this Agreement.

Any notice required in this Agreement shall be provided to the following parties:

If to PI: Contact Name: _____
 Contact Address: _____
 Contact Address: _____
 Contact Telephone: _____
 Contact Facsimile: _____

If to Customer: Contact Name: _____
 Contact Address: _____
 Contact Address: _____
 Contact Telephone: _____
 Contact Facsimile: _____

Recipient's Name and Mailing Address:

Digital Media (choose one)

3.5" diskette (1.4 megabyte) _____ 5.25" floppy disk (1.2 megabyte) _____

Distribution Fee (This fee covers PI's cost of delivery and does not include any charge for codes or data) \$250 per year

IN WITNESS WHEREOF, the parties have caused this Agreement to be signed by their duly authorized representatives.

(Customer)

PETROLEUM INFORMATION CORPORATION

By: _____
Name: _____
Title: _____
Date: _____

By: _____
Name: _____
Title: _____
Date: _____

Agreement

10/25/93

THIS AGREEMENT is entered into effective this ____ day of _____, 1993, by and between Petroleum Information Corporation, a Delaware corporation (PI), and the Natural Gas Supply Association, a Trade Association (NGSA), and the Interstate Natural Gas Association of America, a Trade Association (INGAA), the two Trade Associations acting jointly as temporary surrogates for all parties in the natural gas market who may want to electronically communicate with trading partners utilizing common codes for natural gas transaction points.

It is contemplated that the Federal Energy Regulatory Commission (the Commission) that issued Notice of Proposed Rulemaking which was promulgated on July 29, 1993 in Docket No. RM93-4-000 -- Standards for Electronic Bulletin Boards Required under Part 284 of the Commission's Regulations, may wish to join in this Agreement. If such is the case, PI, NGSA and INGAA will reach an understanding with the Commission as to any conditions that the Commission places upon its execution hereof and under what circumstances the Commission has determined to provide its execution.

For good and valuable consideration and in consideration of the mutual covenants hereinafter set forth, the parties to this Agreement hereby agree:

1. PI has developed and owns the PI GRID™ Common Code Database (PI GRID Codes) which contains identification codes and associated descriptive matter for natural gas facilities and locations and will allow the use thereof subject to the terms and conditions set forth herein.

2. Definitions for terms used herein include the following:

Code Assignor - means PI who has been selected by WG5 (as defined below) to be the one Code Assignor. PI will maintain and provide to the gas industry a complete database listing of all Transporters' proprietary codes and the cross-referenced PI GRID Common Codes.

Distributors - mean the multiple distributors who provide to the gas industry the PI GRID Codes via various media, without charge, whether on an ad hoc or on a scheduled basis and provide options for a full database listing or only recent updates.

Users - mean Purchasers, Sellers, Operators, Shippers and Transporters as follows:

Purchaser is any party who desires to purchase gas. This includes, but is not limited to, the consumer. The consumer is a category of purchaser who owns the facilities where natural gas is consumed.

Seller is any party who has desires to sell natural gas. This includes, but is not limited to, the producer, who owns the reserves or is the owner of facilities producing natural gas.

Operator is the designated party responsible for coordinating the activities of multiple parties utilizing a physical facility 1) in which two or more owners have an interest or interconnecting facilities or 2) which is the interconnection between facilities owned by at least two different entities.

Shipper is the party who has contracted with the transporter to move gas across the transporter's facilities.

Transporter is the party who owns the facilities used to transport natural gas.

3. Although PI is familiar with the terms and conditions of FERC EBB Working Group #5 (WG5) Final Recommendations Concerning Transaction Point Common Codes dated October 12, 1993 (the Document), a copy of which is set forth in Exhibit A attached hereto and incorporated by reference, PI is not a party to the Document and therefore not bound to the terms thereof. However, PI has made an offer to be the Code Assignor as defined in the Document provided that PI shall make no warranty and shall have no liability with respect to its actions or inactions, errors or omissions, if any, while performing the tasks required of the Code Assignor.
4. PI hereby grants to the parties to this Agreement, including those parties who with the consent of PI and NGSA and INGSa join in this Agreement after the effective date as set forth above, the non-exclusive right and license to use, reproduce and distribute, by sale or otherwise, the PI GRID Codes in any format

or media of its choosing. Such parties may include the PI GRID Codes as part of any database created or yet to be created. The PI GRID Codes and associated data are copyrighted by PI; however, the parties hereto shall have the right hereunder to use the copyrighted PI GRID Codes or reference data in any manner consistent with the purposes of this Agreement, including the basis for the development of any database.

5. The parties hereto agree that PI shall be the entity selected as Code Assignor responsible for assigning the PI GRID Codes and maintaining translation tables between the PI GRID Codes and proprietary codes. The PI GRID Codes and translation tables will be made available by PI to all Users at a nominal charge to cover shipping and handling expenses. The PI GRID Codes can be obtained from PI directly or from a number of Distributors who will be allowed to distribute the PI GRID Codes and translation tables at a nominal charge also. See Exhibit B attached hereto for a Fee Schedule adopted by PI for its use as Code Assignor.
6. If PI resigns or is removed as the Code Assignor, the name "PI GRID Codes" shall no longer be available for use by its successor; however, codes previously assigned shall continue to be valid and can continue to be used as assigned.
7. PI AND EACH PARTY TO THIS AGREEMENT MAKE NO WARRANTY OR REPRESENTATION, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE PI GRID CODES, INCLUDING THEIR QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER PI NOR ANY PARTY HERETO WARRANT THAT THE PI GRID CODES WILL BE FURNISHED OR WILL OPERATE IN AN ERROR-FREE MANNER. ALL SUCH WARRANTIES ARE EXPRESSLY AND SPECIFICALLY DISCLAIMED.
8. IN NO EVENT AND UNDER NO CIRCUMSTANCES SHALL PI OR ANY PARTY HERETO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, EXEMPLARY OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PI GRID CODES, even if advised of the possibility of such damages. Specifically, PI and all parties hereto are not responsible for any costs, including but not limited to, those incurred as a result of lost profits or revenue, loss of use of the computer program, loss of data, the cost of recovering such programs or data,

the cost of any substitute program, claims by third parties, or for any similar costs.

9. The initial term of this Agreement is three (3) years from date of execution. The Agreement will renew automatically for successive one (1) year terms if not otherwise terminated as provided herein. PI and/or all the other parties hereto may terminate the Agreement at the end of any one (1) year term by furnishing 30 days prior written notice to PI or all the other parties.
10. PI shall not assign or subcontract its rights and responsibilities herein.
11. Nothing herein shall be construed to place the parties in a relationship of partners or joint venturers or agent of the other, and no party shall have power to obligate or bind the other in any manner whatsoever.
12. The parties hereto agree to cooperate in every reasonable way to accomplish "FERC EBB Working Group #5 Final Recommendations Concerning Transaction Point Common Codes".

IN WITNESS WHEREOF, the parties hereto have signed and cause this Agreement to be executed on the dates stated below to be effective on the date first stated above.

Natural Gas Supply Association

By: _____

Name: _____

Title: _____

This ____ day of _____, 19__

Petroleum Information Corporation

By: _____

Name: _____

Title: _____

This ____ day of _____, 19__

**Interstate Natural Gas
Association of America**

By: _____

Name: _____

Title: _____

This ____ day of _____, 19__

The following parties have elected to join in this Agreement and have obtained the consent of PI, NGSA and INGAA:

Federal Energy Regulatory Commission

Consent
Initials

PI

By: _____

Name: _____

Title: _____

INGAA

This ____ day of _____, 1993

Consent
Initials

PI

By: _____

Name: _____

Title: _____

INGAA

This ____ day of _____, 1993

Consent
Initials

PI

By: _____

Name: _____

Title: _____

INGAA

This ____ day of _____, 1993

Consent
Initials

PI

By: _____

Name: _____

Title: _____

INGAA

This ____ day of _____, 1993

Consent
Initials

PI

By: _____

Name: _____

Title: _____

INGAA

This ____ day of _____, 1993

Consent
Initials

PI

By: _____

Name: _____

Title: _____

INGAA

This ____ day of _____, 1993

Consent
Initials

PI

By: _____

Name: _____

Title: _____

INGAA

This ____ day of _____, 1993

Consent
Initials

PI

By: _____

Name: _____

Title: _____

INGAA

This ____ day of _____, 1993

EXHIBIT B

I. PI GRID Code Update Fees for Distributors and Users

A. Full File Replacements

1. Diskettes (dispatched by regular mail)

- a. Monthly (pre-bid week) \$480 per year (\$40 per update)
- b. Weekly \$2,080 per year (\$40 per update)
- c. Single Request 1st time no charge,
thereafter, \$80 per request¹

2. Electronic BBS download² \$25 per download¹

B. Transactional Updates

1. Diskette (dispatched by regular mail)

- a. Monthly \$720 per year (\$60 per update)
- b. Weekly \$3,120 per year (\$60 per update)

2. Electronic BBS download²

- a. Monthly \$450 per year (\$37.50 per download)
- b. Weekly \$1,590 per year (\$32.50 per download)
- c. Dally \$6,275 per year (\$25 per download)

¹ These fees to be paid in advance

² Customer to pay for phone calls to access PI's BBS

II. PI GRID Code Assignment Fee for Invalid Gas Transaction Points

If someone other than an owner/operator requests a code for a facility (e.g. a contractual exchange point not involving the owner/operator) that is rejected by the facility's owner/operator as an invalid gas transaction point, PI reserves the right to charge the requester a fee payable in advance for the assignment of a PI GRID Code as this facility will not be of general interest to the gas industry. PI's fees for the assignment of a PI GRID Code to an invalid gas transaction point will be as follows:

Digital Code Assignment (requestor submits data on diskette)	\$ 75.00 plus \$.10 per code
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Hardcopy Code Assignment (requestor submits data via hardcopy)	\$ 10.00 per code
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Fees set forth above may be changed by PI from time to time with 90 days written notice from PI to all the parties to this agreement.

PROVISO that PI will undertake a complete review of all fees accrued pursuant to this schedule six months after the Schedule has been placed into effect. If in fact the results indicate that the fees accrued exceed PI's expense to provide the update services, then PI will reduce its fees and serve notice to that effect to all users and distributors.