IMPROVED RECOVERY FROM GULF OF MEXICO RESERVOIRS

Grant Number: DE-FG22-95BC14802

Louisiana State University
Department of Petroleum Engineering
Baton Rouge, LA 70803-6417

Award Date: February 14, 1995
Anticipated Completion Date: August 13, 1995
Total Government Award: \$1,266,667.00

Principal Investigator: Philip Schenewerk

Project Manager: Gene Pauling
Metarie Site Office

Quarterly Status Report: Covering April 1, 1995 - June 30, 1995

Report Date: July 30, 1995

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

MASTER

RECEIVED
USDOE/PETC
95 AUG 21 AM 11:15
ACQUISITION & ASSISTANCE DIV.

US/DOE Patent Clearance is not required prior to publication of this document.

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

OBJECTIVE

Oil imports have again risen to an alarming level, causing balance of trade deficits that threaten our long-term economic strength and our future position of world leadership. The domestic oil and gas industry has been greatly weakened by a decade of low oil and gas prices, and further declines in domestic oil and gas production appear certain. The nation must address this problem or suffer consequences that potentially threaten our energy independence.

The Gulf of Mexico Basin offers the greatest near-term potential for reducing the future decline in domestic oil and gas production. The Basin is less mature than productive on-shore areas, large unexplored areas remain, and there is great potential for reducing bypassed oil in known fields. The political climate in the states bordering the central and western Gulf of Mexico areas remains favorable for oil and gas exploration, in contrast to regions where there is a moratorium on drilling. Finally, operating costs are lower in the Gulf of Mexico than in frontier areas such as Alaska.

Much of the remaining oil in the offshore is trapped in formations that are extremely complex due to intrusions of salt domes. In addition, over 36,000 square miles of largely unexplored sediments in the central Gulf of Mexico are below sheet-like salt structures. Conventional seismic processing techniques cannot clearly image near or below salt, therefore, substantial volumes of oil may have remained uncontacted by previous drilling. Recently, however, significant innovations have been made in seismic processing and reservoir simulation. In addition, significant advances have been made in deviated and horizontal drilling technologies. Effective application of these technologies along with improved integrated resource management methods offer opportunities to significantly increase Gulf of Mexico production, delay platform abandonments, and preserve access to a substantial remaining oil target for both exploratory drilling and advanced recovery processes.

On February 18, 1992, Louisiana State University (the Prime Contractor) with two technical subcontractors, BDM, Inc. and ICF, Inc., began a research program to estimate the potential oil and gas reserve additions that could result from the application of advanced secondary and enhanced oil recovery technologies and the exploitation of undeveloped and attic oil zones in the Gulf of Mexico oil fields that are related to piercement salt domes.

This project is a one year continuation of this research and will continue work in reservoir description, extraction processes, and technology transfer. Detailed data will be collected for two previously studied reservoirs: a South Marsh Island reservoir operated by Taylor Energy and a South Pelto reservoir operated by Mobil. This data will include reprocessed 2-D seismic data, newly acquired 3-D data, fluid data, fluid samples, pressure data, well test data, well logs, and core data/samples. The new data will be used to refine reservoir and geologic characterization of these reservoirs. Further laboratory investigation will provide additional simulation input data in the form of PVT properties, relative permeabilities, capillary pressures, and water compatibility. Geological investigations will be conducted to refine the models of mud-rich submarine fan architectures used by seismic analysts and reservoir engineers. Research on advanced reservoir simulation will also be conducted.

The research effort is being conducted in four major areas:

- I. Reservoir Characterization Research
- II. Extraction Research - Simulation of Extraction Processes
- III. Extraction Research - Improved Oil Recovery
- IV. Technology Transfer Activities

SUMMARY OF TECHNICAL PROGRESS

Reservoir Characterization Research

During the first full quarter of this project, work has been concentrated on obtaining the 2-D and 3-D seismic data for the South Marsh Island 73 reservoirs' analyses. The 2-D data will be available from Taylor Energy. The non-exclusive sole-source 3-D data has been ordered from Geco-Prakla and is expected to be delivered during the second quarter of this project. In addition, hardware and software for interpreting the data has been ordered and should be delivered within the second quarter of this project.

Also, updated reservoir and geologic data on the previously studied reservoirs in South March Island 73 were being collected.

Extraction Research - Simulation of Extraction Processes

The modification of the BOAST simulator to incorporate adaptive localized grid refinement capabilities using finite methods continued from the past project.

Extraction Research - Improved Oil Recovery

Research in this area was not begun in the first quarter of this project.

Technology Transfer

There was no technology transfer during the first quarter of this project.

REFERENCES

There were no references during the first quarter of this project.