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LOUISIANA STATE UNIVERSITY

AND AGRICULTURAL AND MECHANICAL COLLEGE

Petroleum Engineering Research  
and Technology Transfer Laboratory

September 29, 1993

Mr. Paul Schneider  
Technology Assessment and Research  
Minerals Management Service  
381 Elden Street, MS 4700  
Herndon, VA 22070-4817

Re: Progress Report  
Contract Number 14-12-0001-30441  
"Improved Contingency Procedures for Complications Arising During Offshore Blowout  
Prevention Operations"

Dear Mr. Schneider:

Attached is the final report for a year three project. This report is titled "Analysis of Injecting Water and/or a Friction Reducing Agent as a Means of Reducing Diverter Erosion During Diverter Operations." This project brings to a close the "Extension to Task 12" project described as Project 2 in the Year Three Funding Proposal dated September 17, 1990.

Reduced diverter line erosional benefits were found to be obtainable with injection of fluids into a dry gas/sand diverted flow stream. However as described in the paper, most of the benefits were identified to be derived from relative flow stream velocity changes in lieu of some form of lubrication or heat reduction effects resulting from the injected liquid/pipe wall contact.

The status of those projects currently funded under Year 4 of the LSU/MMS contract is as follows:

**Project 1: Experimental Analysis of Dynamic Kills for Wells on Diverters (Subtask 3A)  
(Funding Level: \$91,938)**

Objective: To define and model the conditions in which kill fluids begin to move downward and collect in the lower part of the wellbore during kill operations.

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Data collection was completed several weeks ago and is now in the final stages of data analysis. Mr. Yong Wang is currently writing up his thesis concerning the project (Dr. Bourgoyne is the major professor on the project) and is expected to be nearing completion in three weeks. Dr. Casariego was also assigned to the project and was in the development phase of a report to the MMS when he abruptly resigned and left LSU. As I relayed to you earlier, this has put the project behind schedule as far as the write-up is concerned since he had completed extensive literature review, but did not complete the writing before leaving.

Every effort is being made at present to bring the project to a close. The anticipated completion date is November of this year.

**Project 2: Development of Improved Fracture Gradient Correlation For Deep Water Drilling Operations (Subtask 8A)**

Objective: To develop improved methods for prediction fracture gradients in offshore deep water operations.

This project has been completed as far as research is concerned, but is in its third and final review/revision. It is anticipated that the review will be completed this week and be forwarded to you the following week. On November 17, 1993, portions of this work will be presented by Mr. Rocha at the IADC Well Control Conference of the Americas in Houston, Texas.

Should you have questions concerning the status of any of the above projects, please don't hesitate to call.

Yours truly,



O. Allen Kelly  
Director

cc: A.T. Bourgoyne, Jr., Ph.D  
Luis Alberto Rocha  
Yong Wang