PROGRESS REPORT

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DEVELOPMENT OF IMPROVED BLOWOUT PREVENTION PROCEDURES TO BE USED IN DEEP WATER DRILLING OPERATIONS

submitted to

The United States Geological Survey

Department of the Interior

Reston, Virginia

PETROLEUM ENGINEERING DEPARTMENT
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Baton Rouge, Louisiana 70803

September 1, 1980

PROGRESS REPORT

May 15, 1980 - August 15, 1980

Development of Improved Blowout Prevention Procedures for Deep Water Drilling Operations

Contract No. 14-08-0001-17225, Mod. 1
Effective Date: August 23, 1978
Expiration Date: August 31, 1982
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RESEARCH OBJECTIVES

The primary objectives of the proposed research are the development of improved blowout prevention procedures to be used in deep water, floating drilling operations. The overall research plan was divided into eight tasks which would take approximately four years for completion. The project funding received under the present contract was $187,096 to perform Tasks 1, 3, 4a-b, and 5. These tasks include:

Task	Description
1	Design of a well for accurately modeling blowout control operations on a floating drilling vessel in deep water.
a.	Well scaling and design.
b.	Preparation of bids and specifications.
3	Documentation of blowout control equipment configuration and procedures used on all floating drilling vessels capable of drilling in deep water.
a.	Equipment configuration.
b.	Shut-in procedures.
c.	Start-up procedures.
d.	Pump-out procedures.
4	Experimental study of shut-in procedures for blowout control on floating drilling vessels in deep water.
a.	Experimental determination of frictional area coefficient profile of modern adjustable chokes and HCR valves used in Blowout Control operations.
b.	Experimental determination of frictional area coefficient profile of modern annular Blowout Preventers During Closure.
5	Experimental Study of Procedures for Handling Upward Gas Migration during the Shut-in Period.
a.	Evaluation of conventional approach requiring use of surface drill pipe pressure.

b. Evaluation of volumetric methods.

c. Laboratory investigation of gas bubble fragmentation while rising in a static annulus.

d. Development of mathematical model of well behavior during shut-in period following a gas kick.

e. Determination of optimal method of handling upward gas migration during shut-in period.

ACCOMPLISHMENTS

Task 1, well scaling and design, has been completed. A scale model of the proposed new facility has been constructed. The scale model will facilitate obtaining industry support for much of the needed equipment as well as provide a model for the construction phase of the project.

The necessary supplimental support from industry has been obtained to initiate work on Task 2 as soon as funding for this task is approved by the USGS. Bid specifications are being advertised and bid solicitations are underway. Bid selection and work scheduling could be done in October pending USGS funding of Task 2.

Task 3, the documentation of blowout control equipment configurations and procedures is being hampered by an unwillingness of several drilling contractors to release some of the needed rig data in a timely manner. However, a large amount of data has been collected and Bob Surcouf has begun writing his M.S. thesis using the information available. New data will be included in the documentation as quickly as it is received.

The experimental work on Task 4 has been completed, pending final data analysis. Data reduction and analysis is almost complete and Kerry Redmann has begun writing his M.S. thesis on this phase of the research.

The experimental work on Task 5a and 5b is complete and Jeff Mathews has written his M.S. theses on this phase of the research. A technical

paper is now in preparation for submission to the Society of Petroleum Engineers to present some very interesting results. The experimental work on Task 5c and 5d is almost complete and Vicente Casariego has begun writing his M.S. thesis on this phase of the work.

The attached photograph, taken by Mr. Casariego, illustrates a slug flow pattern in a well annulus during simulated well control operations. Simultaneous views from two sides of the column was made possible through use of a mirror.

PROBLEMS

Before additional experimental tasks can be undertaken, Tasks 2a and 2b must be completed. A proposal for funding Task 2a was submitted during February, 1980 with a proposed initiation date of May 1, 1980. Since funding has not yet been received, the project is falling seriously behind schedule. Funding for initiation of Tasks 2b, 4c,d, 6a,b, and 7a,b, was requested for September 1, 1980 and has also not been received. A review of our current budget status indicates that all funds have been spent and the account is slightly overdrawn. The situation has become critical and personnel will have to be reassigned to other projects if funds for continuation of this project are not received soon.

No major technical problems have been encountered since our last progress report and no significant changes in the project are desired.

Adam T. Bourgoyne, Chairman
Petroleum Engineering Department

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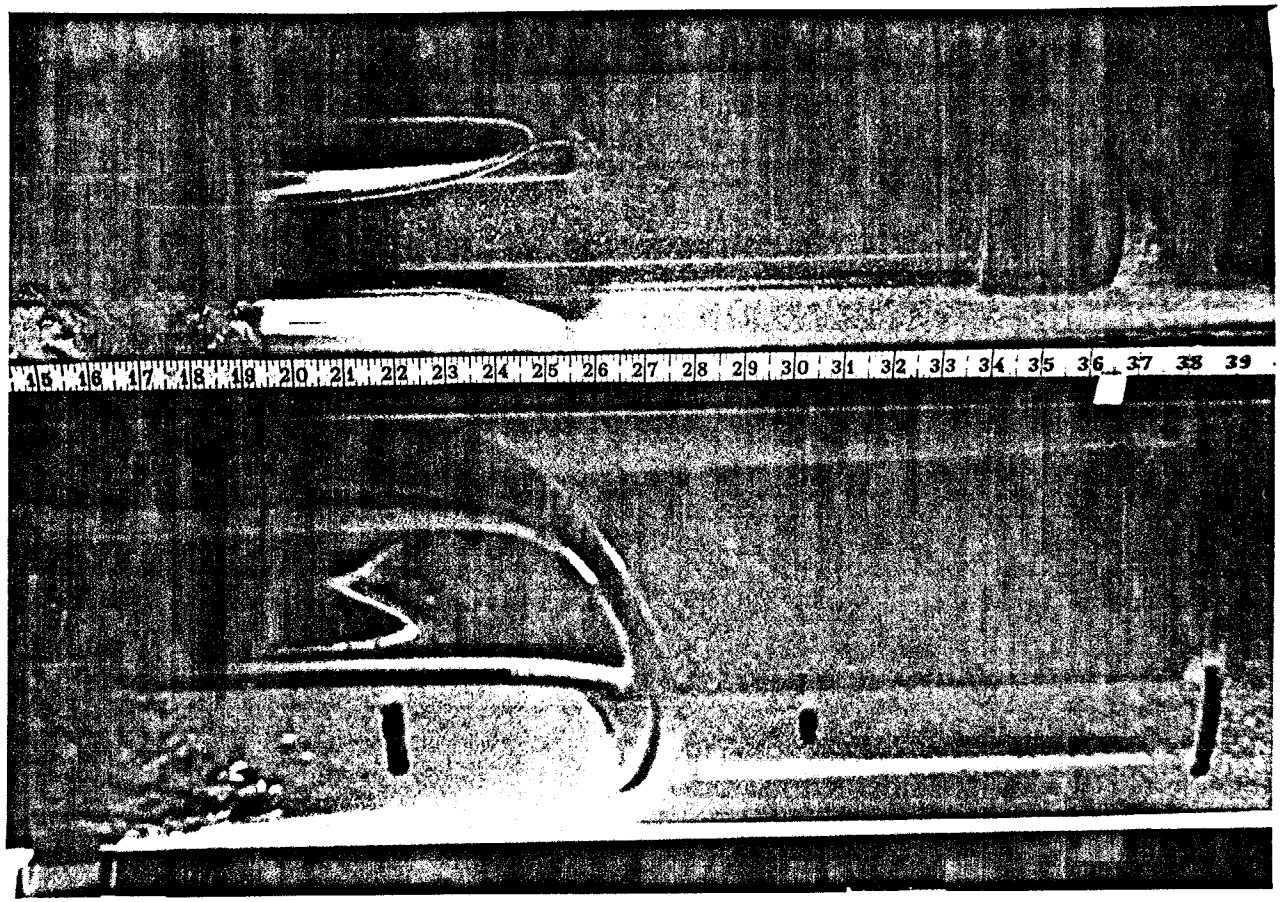
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