Report Title: Low Cost Methodologies to Analyze and Correct Abnormal Production Decline In Stripper Gas Wells

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Abstract

The goal of this research program is to develop and deliver a procedure guide of low cost methodologies to analyze and correct problems with stripper wells experiencing abnormal production declines.

A study group of wells will provide data to determine the historic frequency of the problem of abnormal production declines in stripper gas wells and the historic frequency of the causes of the production problems. Once the most frequently occurring causes of the production problems are determined, data collection forms and decision trees will be designed to cost-effectively diagnose these problems and suggest corrective action. Finally, economic techniques to solve the most frequently occurring problems will be researched and implemented. These systematic methodologies and techniques will increase the efficiency of problem assessment and implementation of solutions for stripper gas wells.

This third quarterly technical report was to describe the data reduction and methodologies to develop decision trees, identify cost effective techniques to solve the most frequently experienced problems and then apply the methodology to a group of wells where recent problems have developed. Further, this third quarterly technical report was to describe the data reduction and methodologies to select the two wells with the greatest potential for increase and also having the most frequently occurring problem, and evaluate the results of the methodology and the implemented procedure.

However, preparation and analysis of the decision trees is more complex than initially anticipated due to the combination of problems rather than identifiable individual problems. Therefore, this portion of the study is still in progress. We have requested and been granted verbal approval for a six month no cost extension to allow more time to thoroughly investigate this portion of the study. The delivery of the decision trees will be included in future technical reports. Work on the other tasks to be completed in this third quarterly report could not begin until completion of the decision trees.
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Not Applicable
Introduction

The goal of this research program is to develop and deliver a procedure guide of low cost methodologies to analyze and correct problems with stripper wells experiencing abnormal production declines.

A study group of wells will provide data to determine the historic frequency of the problem of abnormal production declines in stripper gas wells and the historic frequency of the causes of the production problems. Once the most frequently occurring causes of the production problems are determined, data collection forms and decision trees will be designed to cost-effectively diagnose these problems and suggest corrective action. Finally, economic techniques to solve the most frequently occurring problems will be researched and implemented. These systematic methodologies and techniques will increase the efficiency of problem assessment and implementation of solutions for stripper gas wells.

The following is the third quarterly technical report which was to addresses the data reduction methods and conclusions for each of the following tasks: 1) Develop Decision Trees, 2) Identify Cost Effective Techniques to Solve the Most Frequently Experienced Problems, 3) Apply Methodology to a Group of Wells Where Recent Problems have Developed, 4) Select the Two Wells with the Greatest Potential for Increase and also Having the Most Frequently Occurring Problem, and 5) Evaluate the Results of the Methodology and the Implemented Procedure.

However, preparation and analysis of the decision trees is more complex than initially anticipated due to the combination of problems rather than identifiable individual problems. Therefore, this portion of the study is still in progress. We have requested and been granted verbal approval for a six month no cost extension to allow more time to thoroughly investigate this portion of the study. The delivery of the decision trees will be included in future technical reports. Work on the other tasks to be completed in this third quarterly report could not begin until completion of the decision trees.
Executive Summary

The goal of this research program is to develop and deliver a procedure guide of low-cost methodologies to analyze and correct problems with stripper wells experiencing abnormal production declines.

A study group of wells will provide data to determine the historic frequency of the problem of abnormal production declines in stripper gas wells and the historic frequency of the causes of the production problems. Once the most frequently occurring causes of the production problems are determined, data collection forms and decision trees will be designed to cost-effectively diagnose these problems and suggest corrective action. Finally, economic techniques to solve the most frequently occurring problems will be researched and implemented. These systematic methodologies and techniques will increase the efficiency of problem assessment and implementation of solutions for stripper gas wells.

This third quarterly technical report was to describe the results of the following five tasks: 1) Develop Decision Trees, 2) Identify Cost Effective Techniques to Solve the Most Frequently Experienced Problems, 3) Apply Methodology to a Group of Wells Where Recent Problems have Developed, 4) Select the Two Wells with the Greatest Potential for Increase and also Having the Most Frequently Occurring Problem, and 5) Evaluate the Results of the Methodology and the Implemented Procedure.

However, preparation and analysis of the decision trees is more complex than initially anticipated due to the combination of problems rather than identifiable individual problems. Therefore, this portion of the study is still in progress. We have requested and been granted verbal approval for a six month no cost extension to allow more time to thoroughly investigate this portion of the study. The delivery of the decision trees will be included in future technical reports. Work on the other tasks to be completed in this third quarterly report could not begin until completion of the decision trees.
Experimental

No experimental methods, materials, or equipment were used in this phase of the research.
Results and Discussion

According to the timeline provided by James Engineering, Inc. to the National Energy Technical Laboratory, James Engineering, Inc. was to accomplish the following tasks by June 30, 2000:

1. Develop Decision Trees
2. Identify Cost Effective Techniques to Solve the Most Frequently Experienced Problems
3. Apply Methodology to a Group of Wells Where Recent Problems have Developed
4. Select the Two Wells with the Greatest Potential for Increase and also Having the Most Frequently Occurring Problem
5. Evaluate the Results of the Methodology and the Implemented Procedure

Each task identified above will be reviewed in detail and describe the methodologies utilized.

Task 1 – Develop Decision Trees.

“Develop decision trees to identify the problem causing the production decline and select the most appropriate solution. The decision trees will utilize pressure and rate information gathered on the data collection forms as well as field test results to direct the operator to the most likely cause of the problem.”

Data Reduction and Methodology

Preparation and analysis of the decision trees is more complex than initially anticipated due to the combination of problems rather than identifiable individual problems. Therefore, this portion of the study is still in progress. We have requested and been granted verbal approval for a six month no cost extension to allow more time to thoroughly investigate this portion of the study. The delivery of the decision trees will be included in future technical reports.

Task 2 – Identify Cost Effective Techniques to Solve the Most Frequently Experienced Problems.

“Through experience in operating stripper wells, identify those techniques employed successfully in correcting problem wells. Develop techniques to quickly estimate production increases, then prepare economics of the proposed work to calculate pay out, rate of return, and profit to investment ratio.”
Data Reduction and Methodology

No work was completed on this task during the current report period.

Task 3 – Apply Methodology to a Group of Wells Where Recent Problems have Developed.

“From the study group, select a number of wells with recent abnormal declines. Evaluate the cause of the decline using the methodology and the diagnostic tools developed, and evaluate the potential for increase. Using the estimated cost, evaluate the group to select the most economic candidates. Remediation strategies may include equipment changes, well-bore cleanup, line pressure and other restriction reductions and reservoir simulation.”

Data Reduction and Methodology

No work was completed on this task during the current report period.

Task 4 – Select the Two Wells with the Greatest Potential for Increase and also having the Most Frequently Occurring Problem.

“Use these two wells for the field demonstration portion of the project and install whatever equipment has been determined most efficient for the problem identified. Perform recommended procedures, then monitor the effectiveness of the enhancement program for a minimum of two months and adjust as necessary.”

Data Reduction and Methodology

No work was completed on this task during the current report period.

Task 5 – Evaluate the Results of the Methodology and the Implemented Procedure.

“Any decline in production can dramatically affect the economics of a stripper gas well. Document the implementation of the process from the initial evaluation of the production decline curve to the determined cause of the decline. Monitor the results of the work performed on the wells in the field to determine the effectiveness and potential repeatability of the process. Compare the results to those expected as well as those experienced in other wells with similar producing characteristics.”
Data Reduction and Methodology

No work was completed on this task during the current report period.
Conclusion

Preparation and analysis of the decision trees is more complex than initially anticipated due to the combination of problems rather than identifiable individual problems. Therefore, this portion of the study is still in progress. We have requested and been granted verbal approval for a six month no cost extension to allow more time to thoroughly investigate this portion of the study. The delivery of the decision trees will be included in future technical reports. Work on the other tasks to be completed in this third quarterly report could not begin until completion of the decision trees.
References:
Not applicable.

Bibliography:
Not applicable

List of Acronyms and Abbreviations:
Not applicable.

Appendices:
Not applicable