EXPERT SYSTEM FOR MUD LOSSES & STUCK PIPE PROBLEMS DURING DRILLING OPERATIONS

By

Ahmed Mahmoud Mohamed Abu-El-Ella

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science
In
Petroleum Engineering

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Under the Supervision of

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Title of Thesis:
Expert System for Mud Losses & Stuck Pipe During Drilling Operations.

Key Words:
Drilling Operation; Drilling Problems; Mud Losses; Drilling Fluids; Stuck Pipe.

Summary:
Drilling operations are often accompanied by problems which have many adverse effects on the overall progression of the entire endeavor, and dealing with them can; in many cases can cause to the success or the failure of the whole operation. Efficiency of drilling operations is usually expressed in many parameters; such as, overall cost and NPT (Non-Productive Time). Mud losses and pipe sticking are two of the major drilling problems that can have severe effects on the above mentioned factors. Logically speaking, the best possible way to deal with any problem is to avoid it all together. However, achieving such a goal would require the ability to anticipate, detect and intercept the problem before it occurs, which requires certain levels of experience and knowledge from all parties included in the planning and execution phases of the drilling operations. Thus, a need for a platform which combines, experience, knowledge, history data and ease of access is not only understood; but also, any efforts to cover such gaps are always welcomed and appreciated.

The EXPERT SYSTEM program is user friendly platform that integrates previous experiences, accumulated knowledge, recorded history data, along with real time collected data to provide the end user with both; preventive measures that help in avoiding incidents leading to mud losses or sticking of drill string pipes. Also the corrective counter measures shall any of those problems occur during drilling operations.

DISCLAIMER

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Date:

Signature:

DEDICATION

I would like to present this writing to my family for giving me all the inspiration and support I need.

ACKNOWLEDGMENTS

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