

CHAPTER I

INTRODUCTION

One of the most important phases in petroleum development is planning process. There are a series of steps and operations that go into completing a successful well. Many of them are interconnected, and the expense of a well in today's market requires that consideration be given to efficient economical and safe planning. The management during well planning will reduce the potential of drilling hazards, such as kicks, wellbore instability, stuck pipe and lost circulation including excessive torque and drag. This will contribute to increase safety margins, reduce risks and reduce drilling nonproductive time (NPT) costs.

Torque and drag (T&D) analysis has been used for more than twenty years which is regarded as extremely useful in well planning because it helps to predict and prevent unexpected circumstances that might occur during the drilling process. The primary used of T&D software is a well's planning to project the well trajectory, especially in extended reach of modern horizontal wells that we try to optimize the oil and gas production in the target field through drilling deeper and further. As a result, with the global trend growing toward drilling extended reach wells (ERW), engineers can no longer ignore the high torque and drag forces expected in the well.

This research developed more accurate software for torque and drag analysis based on three-dimensional (3D) calculations (Prurapark, 2009). Helical bucking problems normally cause lock-up and fatigue potential. This research's software also prevents torque and drag problems while drilling by trying to optimize well profiles before drilling begins. Moreover, this research shows the relationship between well planning and T&D calculations in 3D wellbore. This makes it easier to find out which type of well design is more suitable in each particular area.

This software evaluates the planned drilling operations with respect to drilling field data provided by operator that helps field personnel to prepare for unexpected trend changes in a timely fashion during the drilling process and also plans to drill the next upcoming well. A user is able to anticipate T&D values by only inputting wellbore data and T&D parameters. Consequently, the outcome of the data

from the T&D software is more realistic with improved efficiency and safety, while protecting health and the environment.