



Increase Equipment Life and Reduce Work-over Frequency

Unidentified Micro-Doglegs are responsible for:

- **Premature Wear**
- **Equipment Failures**
- **Increased Power Consumption**
- **Lost Production**
- **Warranty Waivers**

A Micro-Guide Deviation Log:

- **Identify Micro-Doglegs not detected by normal surveys**
- **Optimize pump and guide placement**
- **Can be re-processed to focus on problem areas**
- **Measure your well profile in ultra high definition, inch by inch**

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PROBLEM

Undetected micro doglegs are causing premature failures in artificial lift assemblies.

Software using data sourced from surveys of long course lengths, unknown accuracy and age is currently used to calculate dogleg. The software assumes a constant curvature between data points but this is rarely the case. This "questionable" information is then used to calculate stress.

Effects of undetected micro dogleg on artificial lift assemblies include:

ESP failure, premature wear, excessive power consumption, warranty waivers, uneven bearing load and seal failure.

Pump Jack

Unknown micro doglegs result in poor placement of rod guides causing high side loading, increased drag coefficient and accelerated tubing/rod wear. This inefficient design results in increased horse power demand necessitating larger motors and increased energy consumption. Poor guide placement also increases gearbox wear and rod buckling.

ESP

Approximately three thousandths of an inch is all that separates the rotor and the stator within the ESP electric motor. Any bending of the motor may cause the rotor to contact the stator causing an electrical short. In order to maintain adequate fluid velocity, for motor cooling, the ESP must run in close tolerance to the casing ID. Poor well geometry will result in pump misalignment.

A major player in North America estimates ESP failure due to unidentified DLS at 4% annually.

THE SOLUTION

A Micro-Guide deviation log. It removes any doubt

Unlike traditional surveys typically collected at intervals of approximately 100ft. A Micro-Guide deviation log, will identify micro doglegs based on data points of less than a foot, on the fly, in realtime. Providing you with information to precisely determine the best location for ESP's or rod guides.

Give your ESP and rod guides the greatest chance of success

Accurately log your well for DLS to:

- Promote ESP longevity
- Reduce power consumption
- Preserve your warranty
- Save money

