

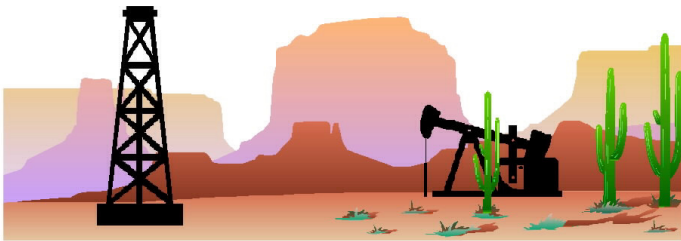


Drilling Fluids, Inc.

TECHNICAL SERVICES NEWSLETTER

Volume XV, Number 1

February 26, 2011



SO YOU WANT TO BE A MUD ENGINEER

An Introduction to Drilling Fluids Technology
By Andy Philips

This is the first page of a new book being written about mud engineering.

Introduction

In an ideal world, people who wanted to become Mud Engineers would have all the tools necessary to understand the science and politics involved. An ideal candidate would have a Bachelor of Science degree with college level courses in Chemistry, Physics and Geology. This gives the student a basis for the hard science that is used in the drilling industry and the drilling fluids business in particular. Another tool the student would bring is two or more years of experience working on a drilling rig as a Pipe Racker, Motor Man, Derrick Hand and Driller. The understanding of

Mud Engineer
(Continued on page 2)

Big jobs usually go to the men who prove their ability to outgrow small ones.

-Theodore Roosevelt-

WHAT DO YOU WANT IT TO BE?

1. The API method for the Retort calls for steel wool that is: a) very fine, b) "000", c) "00", d) fine enough to prevent migration.
2. Tool joint OD can be significant for: a) theoretical pressure, b) hole volume calculations, c) ECD, d) all of the above.
3. How accurate is Electrical Stability? a) Very accurate, b) Not very accurate, c) ± 10 volts, d) ± 50 volts.

ANSWERS ON PAGE 4

WHO ARE YOU WORKING FOR?

Either Way be Careful!

Here is what you need to know about your valentine and heart disease. Classic heart attack symptoms for both sexes include pain or pressure in the chest, shortness of breath, and pain in the neck, back or stomach. One third of women who have heart attacks have no chest pain, however, and may have milder symptoms such as nausea, vomiting, dizziness, and jaw pain. Some women experience unusual fatigue, sleep problems, indigestion, and

Safety
(Continued on page 5)

Safety ALERT
RESPONSE REQUIRED

Mud Engineer

(Continued from page 1)

how a rig functions, down to the nuts and bolts, as well as the interrelationship of the people who populate a rig is a great asset. A two year stint in the Army, Navy, Air Force or Marines would give him an understanding of how to follow orders, even when he knows they are wrong. And lastly, the student would have worked as a professional cook for a period of time. Making and maintaining mud has a lot in common with cooking. In addition to the ability to put together the right ingredients, a mud engineer must satisfy some very picky customers.

I've never met a Mud Engineer with all of these qualifications. Do not despair if you feel you are under qualified. The most important learning takes place on the rig after mud school.

This book is an effort to provide "worms" (newcomers to drilling) with as many tools as they can absorb before being thrown to the wolves. I don't know anyone who felt they were ready to run mud when they got out of mud school, not even the ones who immediately were given a rig and told to call if they didn't know what to do.

Much of what follows is a compilation of lectures I delivered to more than 125 Mud School students over a period of about 15 years. It occurred to me that these lectures would be of more value if the student could return to them from time to time. I'm quite certain that when I talk about mud for an hour, no one who is not already a field engineer with years of experience will remember even half of what I have said. So read this and listen to everything that anyone in the field has to say. Important knowledge may come from anyone.

This book is intended to provide a basic understanding of the work a Mud Engineer does onshore in the Western United States. Most of this is probably appropriate for any Mud Engineer but there are certainly some problems that are dealt with differently in other areas.

No one comes out of mud school a trained Mud Engineer. The best you can hope for is a technical



GEO Drilling Fluids Mud School

background and lots of resources to answer questions. The real ability to run mud intelligently comes from years of experience with the many different problems and potential solutions found while actually drilling a well. It is hoped that this book will provide some of the training and serve as a resource in years to come.

BILLING

TRAILER RENTAL

If you are renting a trailer to GEO then it is very important that you do the billing properly. **DO NOT** attach your billing to an Expense book. Send the invoice directly to Gwyn or place it on her desk.

REMINDER TO ALL MUD ENGINEERS

When tracking material on your inventory, remember that each product needs to be kept in a separate column. Similar products, even when they have the same price, must be tracked independently. Flowzan and GEOZAN are different products. Cal Carb comes in different mesh sizes and each must be tracked by itself.

DOUBLE-SHOULDER PIPE

New generation of double-shoulder drill pipe connection yields improved connection time and reduced damage.

Drill pipe tool joints have to be able to make up quickly, withstand the abuse of hundreds of cycles of make up/break out, and form a perfect seal to pressures in excess of 2000 psi. State of the art developments in the technology available are presented here.

A key objective for the development of the third-generation (3G) double shoulder connection (DSC) was to improve connection makeup and breakout speeds relative to second-generation DSC's. The new connection incorporates a double-start thread that reduces by half the number of revolutions to assemble and disassemble the connection. Also, the 3G connection provides increased mechanical performance, larger ID and enhanced fatigue performance. The first 3G DSC drill string used was 5 7/8" in. 26.30-lb/ft S-135. The rig crew experienced

an adjustment period during makeup of about the first 10 connections. Makeup speed of the new connection was realized, and analysis of well data demonstrated improved efficiency and cost savings.

In response to the field performance feedback of the first two wells 3G DSC was used on, a program was initiated to monitor and improve the value of the connection on future wells. The subsequent implementation of improved maintenance procedures and equipment modifications improved running times. A key benefit observed throughout the project was reduced connection damage (over 80%) and reduction in repair rates and costs com-

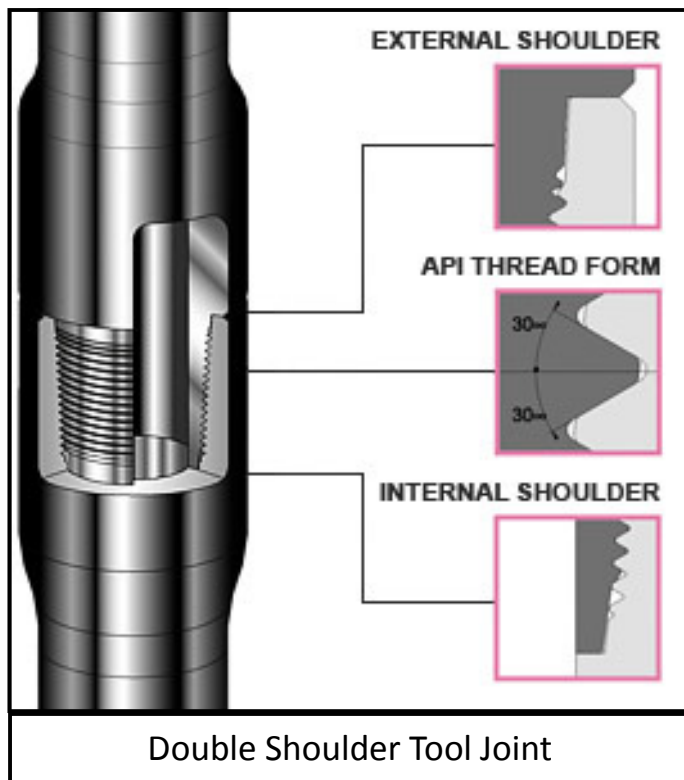
MUD MAN'S CORNER

- 1) You must drive safely and defensively.
- 2) You must obey all traffic laws and regulations.
- 3) You must maintain your license as current at all times.

4) You must maintain a DMV point count of two or less. A DMV point count of two may even get you disqualified. The qualification or disqualification is entirely up to the insurance provider and is irrespective of any DMV restrictions.

5) **You must not allow any person other than a GEO employee to drive a GEO vehicle.**

6) The possession of a company vehicle is a privilege necessary for commuting purposes on a 24-hour seven-day per week basis. Fuel and maintenance are provided for business purposes. The employee must pay a mileage fee for non-business vehicle use. The amount charged is calculated using "Special Method #3 – Commuting Value" as detailed in Appendix J. The company may rescind the use of this vehicle for employees not adhering to company policies.



pared with similar wells using the second-generation (2G) connections.

Development of the 3G DSC Tool Joint

First-generation DSC's, introduced in the early 1980's, were API rotary-shouldered connections (primarily numbered-connection and full-hole) with a second shoulder added inside the box member at the pin-nose interface. First-generation (1G) DSC's and API connections shared the same basic design

Double Shoulder Pipe

(Continued on page 4)

Double Shoulder Pipe

(Continued from page 3)

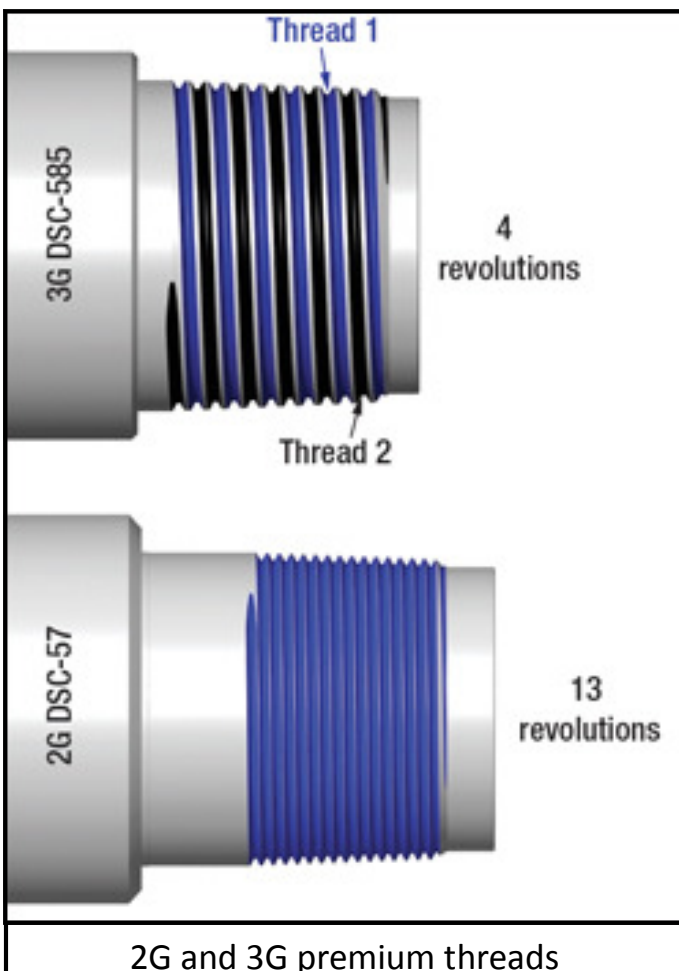
features, such as thread form, taper, lead and pitch diameters, while the secondary shoulder provided a simple means to increase the connection torsional strength by about 40% over the corresponding API connection. The increase in torsional yield strength allowed streamlined designs with increased ID and/or decreased OD for improved hydraulic performance of the drill string. As more aggressive drilling programs were implemented it became clear that a new generation of DSC with higher torque and more streamlined profiles was required. The

an improvement of about 65-70% compared to a standard API connection with the same OD and ID. The streamlined connection dimensions, enabling one pipe size larger to be run in the same hole size, dramatically improved hydraulic efficiency while maintaining equivalent fishing capability.

Since the introduction of 2G DSC, the industry’s continued trend toward deeper and longer-reach wells has dictated the need for drill pipe connections with enhanced mechanical and dimensional characteristics coupled with improved makeup and breakout speeds. As a result, a project was commissioned in 2005 to design, analyze and test 3G DSC. One of the primary differences between 3G DSC and its predecessors is the addition of a double-start thread, which incorporates two thread leads spaced 180° apart to reduce by 50% the number of turns needed to assemble or disassemble the connection. Changes in thread taper and thread pitch further reduce the number of revolutions required to make up or break out the connection. When comparing the 3G DSC to its 2G counterpart for use on 5 1/8” drill pipe, the number of revolutions to make up or break out the connection is reduced from 13 to 4.

API tool joints are produced with specified minimum yield strength (SMYS) of 120,000 psi. Capitalizing on advancements in metallurgy and heat-treatment techniques for high-strength, high toughness steel grades, the new 3G DSC employs tool joints of 130,000 psi SMYS to enable improved torsional capacity and more streamlined dimensions for hydraulic efficiency.

Most of the test runs with 3G DSC were in the deep-water Gulf of Mexico where trip times are at maximums. New technologies like this can save a lot of money over the course of a drilling program and allow operators to increase the number of wells drilled each year.



2G and 3G premium threads

second-generation DSC drill pipe, introduced in 1998, was designed with an enhanced thread form to reduce stress concentration, a flatter taper to increase shoulder area, and tighter tolerances.

The 2G connection provided about 25-30% more working torque capacity than 1G DSC did, or

ANSWERS TO WHAT DO YOU WANT IT TO BE?
 1. (b) „000“
 2. (c) ECD {it affects the others but only to a mi-
 nor degree.
 3. (d) ±50 volts

BOOMTOWN

A new documentary chronicles a small town's struggle with a sudden oil boom. The tiny town of Parshall, N.D., is isolated, windswept and frigid, like most northwestern American communities. It is located in the same part of the state as Williston, Minot and Belfield, less than 100 miles from Sidney, Montana in the heart of the drilling GEO is servicing. With a population of 1073, Parshall holds the record for the coldest temperature ever recorded in North Dakota (-60 degrees Fahrenheit). The economy of this small community, like so many other similar towns across America, has been in steep decline for many years. As manufacturing and farming jobs have moved overseas town residents have sought greener pastures and a better life. But recently, something amazing happened.

Below the wheat fields and the grocery store and the high school football field, surveyors discovered oil — barrels upon barrels of thick, unrefined, highly sought-after crude oil. Planet Green's original docu-series BOOMTOWN, airing Saturdays at 10 PM (ET) beginning on January 29, tells the tale of this struggling American town in the midst of a profound reversal of fortune.

BOOMTOWN is an unconventional case study of how the domestic oil and gas industries are exploring every option here on U.S. soil — but at what cost? In an illustration of what's happening in small towns across America, practically overnight, many of Parshall's residents and landowners are transformed from ordinary folks into millionaires. But not everyone gets rich quick, and not everyone thinks this new development will end well for the residents of the town.

BOOMTOWN is a five-episode series produced for Planet Green.

While this series doubtless presents the downsides of the boom there are some interesting side effects that we have become aware of. Many of the small towns have decided they don't want to be ruined by the boom. They have intentionally kept out a housing boom so that when the drilling ends they won't be left with an infrastructure they can't support. As a result, it is nearly impossible for the many transient oil field workers to find a place to

stay. Motels are booked by the month by major service companies. Buying a house that is not planned to be used on a full time basis is good business for companies that can't find housing for their crews.

Safety

(Continued from page 1)

anxiety up to a month prior to a heart attack. Men are at higher risk for heart disease at an earlier age than women, but the difference narrows after women reach menopause. At age 65, the risk is about the same when other factors are similar. Women who take birth control pills, especially those who smoke and are over age 35, are at increased risk. Not smoking, regular exercise, maintaining a healthy weight, and controlling blood pressure and cholesterol levels can protect against heart disease for both men and women. – American Heart Association

ITS NEVER TOO LATE

Quitting smoking at ages 51 or 52 can add 3.4 years to your life!

Men who increase their physical activity beginning at ages 50-60 reduce their mortality by as much as if they were smokers who quit.

Women and men who become physically active as late as ages 70-85 enjoy significantly longer survival.

Why Should You Come Home?

One of the ways to keep focused on safety is to remember that you want to come home safely at the end of the day. We all have someone who would miss us if we got hurt or killed on the job or driving. For some it is a spouse, for others it is children or grandchildren. And for some it is a parent or parents. For some of us it all of the above.

GEO Drilling Fluids is implementing a program for all of its drivers to help them stay focused on safety. We will be gathering pictures of loved ones from every driver of a company vehicle. We will copy them and put them in a transparent hold-

Safety

(Continued on page 6)

Safety

(Continued from page 5)

er to be hung from the rear view mirror as a reminder of "Who You are Working For".

Please submit a picture Andy, either a print or digitally (not a thumbnail), of someone or a group of people who make life worth while for you.

Intersections

Over half of all city crashes happen in intersections. Traffic lights tell you when to stop, but not everyone obeys. Speeding up to get through a yellow light is very dangerous. Jumping into the intersection as soon as the light turns green without looking both ways can put you in front of the idiot

speeding up for the yellow light.

Traffic going straight has the right-of-way over traffic turning. All things being equal, yield to the car on your right. If you can't get all the way through an intersection because of traffic, stay out until traffic moves. Never insist on the right-of-way! Avoid giving up the right-of-way to be polite as it can confuse people and delay traffic.

Use your turn signal at least 100 feet before turning or changing lanes. Slow down and scan the traffic from all directions as you approach an intersection. Never assume that everyone else is going to obey the laws.

 ----- **CUT HERE - Return Lower Portion** -----

GEO Drilling Fluids, Inc. • P.O. Box 1478 • Bakersfield, CA 93302
Telephone (661) 325-5919 • FAX (661) 325-5648 • 1-800-GETSGEO • geodf@geodf.com

SAFETY COMMUNICATION

I have read the safety bulletin covering **Who Do You Work For?** in the GEO Technical Newsletter of **February 26, 2011**. VOLUME XV NUMBER 1

Print your name: _____

Signed: _____

Date: _____

Comments: _____

1. The person/people I work for is/are

_____.

2. Chest pain is {not always} {always} a sign of a heart attack.

Cross out the one that is not true.

3. At a four way stop when two people arrive at the same time, yield to the person on your _____.

Please answer the questions, sign, date and return to Andy Philips, Safety Coordinator / Technical Services Manager within one month of publication date. Any comments would be appreciated. E-mail response accepted.

Thank You.