

# New generation casing drilling technology added to Caledus TD Solutions™ portfolio

By Paul Howlett, chief executive officer, Caledus

Caledus provides a range of products and services to assure that all types and sizes of OCTG reach planned section TD that enhance operational efficiency and reduce NPT. In addition to conventional well construction enhancements Caledus also provides technology that breaks with convention to slim down the well construction architecture through the use of close-clearance flush-joint cased and cemented liners that maximize the size of casing that can be deployed from within the previous casing or liner. To strengthen the options available a new generation of drilling with casing or drilling with liner drill shoes have been introduced. There are three grades of drill shoe in the range at present for soft, medium and hard compressive strength formations.

The Caledus DragonBITE™2 (DB2) Drill Shoe (pictured) is a diamond drilling with casing drill shoe designed to drill soft to medium- soft formations at high rates of penetration. The DB2 drills in much the same manner as a PDC drill bit, except that the casing string takes the place of the drill-string and BHA. The DB2 has a two-part construction; the main body is manufactured from forged steel whilst the nose portion is aircraft-grade aluminum. The cutting structure comprises conventional PDC cutters and thermally-stable polycrystalline diamond (TSP) inserts. The design ensures that the DragonBITE™2 Drill Shoe can be drilled-out quickly and efficiently with either a PDC or roller cone bit or another DB2.

The advantages of drilling with casing in the right operational circumstances are significant. Casing drilling can get casing to planned depth through problem formations (particularly loss zones), reduce the potential for un-planned casing seats, reduce the initial surface casing size (move towards slender well construction) but mainly a reduction in well construction times can be achieved through the reduction or elimination of drill pipe and drilling BHA handling and related tripping times for the sections that are casing drilled instead.

Liner Drilling is also planned by Caledus through the use of their SlimWELL® liner hanger system combined with DragonBITE™ drill shoes so that well sections can be drilled with the liner by rotating the drill-pipe from surface or at least deepened further if the drilling BHA was pulled prematurely. The possibility to drill out cement plugs left in the hole due to losses will also exist with liner drilling.

The addition of the DragonBITE™ drill shoe to the Caledus portfolio is the latest move in the company's drive to provide conventional and unconventional well construction technology to reduce overall well construction costs through efficiency, reducing NPT, but also working towards the slim well. Slender or slim wells will be faster and cheaper to drill whilst at the same time reducing environmental impact without increasing risk or reducing well integrity or productivity. ■



DragonBITE™2 (DB2) Drill Shoe

## WELL CONSTRUCTION TECHNOLOGY

BASED ON A SERIES OF PATENTED CLOSE-CLEARANCE FLUSH-JOINTED LINERS, SLIMWELL® CAN DELIVER A LARGER SIZE OF PIPE AT THE ZONE OF INTEREST THAN CONVENTIONAL TECHNIQUES OFFER AVOIDING ALL THE RISK NORMALLY ASSOCIATED WITH SWAB, SURGE AND HIGH ECD.

TO IMPROVE OPERATIONAL EFFICIENCY, ENHANCE SAFETY AND REDUCE NPT IN WELL CONSTRUCTION, CALEDUS OFFERS A RANGE OF PRODUCTS AND SERVICES TO ENSURE TROUBLE FREE INSTALLATION TO PLANNED TOTAL DEPTH OF CONDUCTORS, CASING AND LINER STRINGS.

CALEDUS IS A WELL CONSTRUCTION TECHNOLOGY BUSINESS, INNOVATING, DESIGNING, MANUFACTURING, PROVIDING AND SUPPORTING PROVEN TECHNOLOGY GLOBALLY.

For more information on SlimWELL® & TD SOLUTIONS™ contact info@caledus.com or visit www.caledus.com

# 'RigMS: global asset tracking and maintenance gold standard'

By Ashe Menon, NOV M/D Totco

## Introduction

Few industries are as complex, capital intensive and globally dispersed as oil and gas - from the skilled people required to find and produce the hydrocarbons to the equipment required for actual drilling. Virtually nothing gets company number crunchers' attention quicker than owned equipment which cannot be readily located for movement to a new drilling site or even found on the company's books and must be purchased anew, often a very costly proposition.

With the industry engaged in high stakes activity 24/7, any responsible company ideally wants to know where every piece of its equipment resides at any given time; and more now, these companies expect full maintenance records Web-accessible and instantaneous. Just a few years ago, many companies were still trying to manually track assets in inventory and at drilling sites throughout the world. In today's digital energy environment, that Model T approach is not acceptable to management, drilling personnel or company stakeholders. The RigMS solution, from the M/D Totco™ product group of Houston-based National Oilwell Varco™ (NOV™), has quickly become the industry's 'gold standard' for electronic asset tracking and maintenance.

## The system is the solution

What RigMS has done in the oilpatch is as remarkable in its simplicity as in its user-friendly electronic functionality. A four-component system, RigMS consists of bar codes, RFID tags, handheld electronic scanner (or reader) and a central database (all connected via the web). Clearly none of these involves 're-inventing the wheel', rather the innovation is how system capabilities have been fine-tuned and tie together in its usage within fifteen minutes or less.

In terms of parts identification, the system innovators determined that bar coding would basically be a fail-safe to the primary and more effective identifier, RFID tagging. With RFID, however, the most important consideration has always been the survivability of the tags in harsh drilling environments.

When that hurdle was overcome and the system first implemented, bar codes and RFID tags were, and continue to be, literally affixed to every piece of equipment owned by

each customer, regardless of wide-ranging locations or sites which are difficult to access. The latest highly ruggedized RFID tags now withstand up to 6,000 psi.

Operationally, the process is straightforward. Once all a company's assets are tagged, personnel utilize the handheld device to read each one and electronically feed that information into a central database. Then, this properly safe and secure information can be Web-accessed, letting users immediately see the equipment's location and status. Also, with a feature which has become just as important, users can just walk up to the equipment and scan the tag to see the asset's maintenance history and immediately get step-by-step instruction on performing any maintenance coming due.

## Customer usage

As to user reaction in the global drilling market, one of the largest producers of natural gas in the U.S. gravitated to RigMS primarily for the capability to know at a moment's notice where all their assets are at all times. Instead of having to make seemingly endless calls to managers, rig managers or offices in general, they found that only being a mouse click away from a database storing the data on every piece of the company's equipment simply made much more sense.

Another U.S. based drilling company, with operations in countries from Africa to Latin America, must deal continually with providing a report on equipment loss. Although report preparation per se was no more than a clerical job, finding the necessary details or input was a much more foreboding task which was virtually impossible on a manual basis. As a result, they wanted to, in their words, 'standardize the search', discovering that with RigMS they could tap a complete central database for equipment location/status and maintenance history/step-by-step maintenance instructions. The concept is to convert everyone into an instant expert: scan the equipment and get on-the-spot instructions outlining exactly what to do.

Those two examples highlight what is rapidly becoming a sea change for companies, especially with crude prices dropping from last year's high of almost \$150 a barrel to less than \$40. One, rig count in first quarter 2009 has dropped notably but more sharply in the U.S. than

in the international sector. That has placed increased pressure on the international workforce, which does not always have an in-depth knowledge base on oilfield equipment primarily supplied by U.S. companies. Therefore, instant web access to detailed equipment information and simplified procedures is very helpful. Considerable time was spent writing instructions in the most understandable way, not just for NOV equipment but for any applicable OEM. The fact that NOV makes approximately 90% of rig equipment just makes it easier to get and organize the maintenance instructions.

Two, due to decreased rig count, more companies are stacking their rigs, essentially putting them 'on hold'. By having the capability to know exactly where all this equipment is located, when the market changes, management can quickly see asset location, condition and which equipment should be deployed in which priority order.

## New features and deployments

Through Release 3.1, RigMS has introduced a new features package including improved software performance, boosting data transfer speed; Bill of Materials, allowing users to track replacement parts usage and replacement costs; expanding the implementation workforce; standardizing asset management procedures companywide and/or globally; and providing an enhanced analytical products suite. System developers are also working on a monitoring system that 'sees' how equipment is functioning on the rig and, for offshore contractors; they are developing a predictive maintenance model.

Currently, RigMS is deployed in wide-ranging areas including the United States, Latin America, Africa and the Middle East, with plans for deployments in Europe, the Far East, Australia and India this year. Most companies typically implement RigMS on a limited basis, then quickly expand worldwide when seeing the unique value-add. ■

Ashe Menon is a product line manager with the M/D Totco product group of National Oilwell Varco (www.nov.com).

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# Flow Line Safety Restraint System helps reduce area of danger surrounding flow line ruptures

By Matthew Treida, marketing analyst



Weir SPM provides on-site service support by trained technicians through its rental program

Weir SPM's Flow Line Safety Restraint System, or FSR, was developed to assist users in increasing safety on their work sites by helping to reduce the area of danger around a high pressure flow line disengagement. To this day, the FSR is still the premier tool to increase safety on site, and help reduce damage to equipment and injury to employees during a flow line rupture.



Taken at an actual site, this photograph shows how the FSR restrains a flow line, increasing safety on site. Notice how the high strength iron pipe was bent but was still contained by the FSR, preventing it from striking an active well to the side.

The FSR System is intended to help contain high-pressure piping and components in case of rupture or excessive impulse during the pumping process. When flow lines fail, whether it is due to excess pressure, faulty connections, worn components, trauma to the piping connection, or otherwise, the results can be devastating and catastrophic to both equipment and personnel. The metal components that were previously being subjected to up to 15,000 psi of internal pressure are suddenly and instantly forced to relieve themselves of the stored energy. In a failure, there could be hundreds or even thousands of pounds of iron pipe flailing about or thrown in an unrestrained condition. During testing, unrestrained heavy-duty steel hose loops were thrown over 300 feet in a flow line rupture scenario. In such instances, there is a high likelihood of severe personal injury or death. The FSR System is intended to help reduce that risk.

The FSR System is easy to install as the flow line is assembled. FSR anchors are installed within the flow line, and rib and spine components are utilized similar to a seat belt in an automobile by tying the flowline to a stable anchor. The durable components weave together and connect to the flow line at multiple points, and are tied off to multiple pumping units or other large, stable items on a pumping site.

The FSR is ideal for both offshore and onshore applications. The System has a tremendous record of successful applications, resulting in the saved lives of many of its users. Due to its

remarkable track record, Weir SPM's FSR System has been approved and is currently being mandated by some of the world's oil majors.

The FSR System is available in convenient rental packages allowing users to meet the increasingly stringent safety demands of the operators, without having to invest the initial capital expense of the product. Weir SPM personnel are available to provide training and support for customers, and can also be brought on site to personally install the System. Weir SPM offers rental baskets or mobile trailers to aide in the convenient transport of the product. The product is inspected regularly, providing customers with reliable components at each installation.

The FSR System is a proven tool to help increase safety on high-pressure pumping sites. This inexpensive tool could mean the difference between life or death for users during flow line disengagements, and is being acknowledged by



The FSR System is easy to install and provides an added level of safety on high pressure pumping sites

the market for its lifesaving potential through its increased utilization. More information and sales inquiries on the Flow Line Safety Restraint System can be achieved at any of Weir SPM's worldwide branches. Be sure to visit Weir SPM at booth number 1849 during the 2009 Offshore Technology Conference, May 4-7 in Houston, TX. ■

# Weir SPM's self-resetting nitrogen relief valves and remote control panel

By Matthew Treida, marketing analyst



Remote Control Panel

Weir SPM, an industry leader in well service pumps and flow control products, has introduced two 'best in class' remote controlled, nitrogen operated relief valves; the emergency back pressure relief valve specially designed for well service applications, and the full bore unloading valve tailored specifically for the drilling industry.

## Remote relief

Weir SPM's newly designed remote control panel makes adjustment of the nitrogen actuated relief valves as easy as turning a knob. The remote control panel allows the operator to adjust the flow of rig air or nitrogen to either an unloading valve or back pressure valve positioned in the line without compromising safety to do so. Easily adjusted using an engraved quick reference chart, the control panel allows accurate setting and has proven to perform very successfully in the field. The remote control panel creates a safer and more convenient work environment for the user.

## Well service pumping applications

Weir SPM offers the emergency back pressure relief valve for use during well service high-pressure pumping applications. This valve provides over-pressure protection for reciprocating pumps, treating lines, pressure vessels, and other equipment operating under high pressure, high flow conditions. The valve is direct acting, relying on the system's hydraulic pressure to overcome a preset nitrogen gas force to relieve. It is externally adjustable, and is most conveniently adjusted using a remote control panel. Unlike rupture disc relief valves, this valve will reset once the system pressure drops to set

pressure or below. Also, unlike many 'high-lift' devices, this valve exhibits little blow down and will reset at or near the 'cracking pressure.' The emergency back pressure relief valve is intended for



3" 1502 Full Bore Unloading Valve



3" 1502 Emergency Back Pressure Relief Valve

liquid service and operates in pressure ranges from 1,000 psi to 15,000 psi. The valve is well suited for over pressure protection in a 'slick water' medium, fracturing, cementing, or similar pressure pumping services.

## Drilling applications

Weir SPM offers the full bore unloading valve to be used in drilling applications. The valve provides over-pressure protection for reciprocating pumps, flow lines, pressure vessels, and other equipment operating under high pressure, and high-flow conditions during drilling applications. Like the emergency back pressure relief valve, this valve is direct acting, relying on the system's hydraulic pressure to overcome a preset nitrogen gas force to relieve. It is compact and easy to operate, especially when using a remote control panel for external adjusting. The valve behaves similar to a 'high-lift' device in that once it begins to lift; the back pressure is greatly reduced. The valve remains open until the liquid end pressure decays to approximately 16% of the initial set pressure. Once the fluid falls below this approximate threshold, the valve will reset to its original set pressure. The full bore unloading valve is fully adjustable and operates in pressure ranges from 1,000 psi to 15,000 psi. The valve will work well in drilling mud applications and may be suitable for other fluid media.

## Industry leading quality

Like all of Weir SPM's products, both styles of relief valves are designed and manufactured to meet Weir SPM's stringent quality assurance requirements under an accredited ISO-9001 quality and manufacturing system. Every relief valve manufactured by Weir SPM is tested to 150% of its max rated working pressure before shipping to assure it meets all working specifications, and will perform correctly and safely in the field. Also, both the unloading valve and back pressure valve are available with DNV and CE Type Approval. Technical and application questions should be directed to your closest Weir SPM location or to Weir SPM Engineering. ■

For any further information or sales inquiries on these products contact your local Weir SPM branch. Be sure to visit Weir SPM's booth, number 1849, during the 2009 Offshore Technology Conference, May 4-7 in Houston, TX

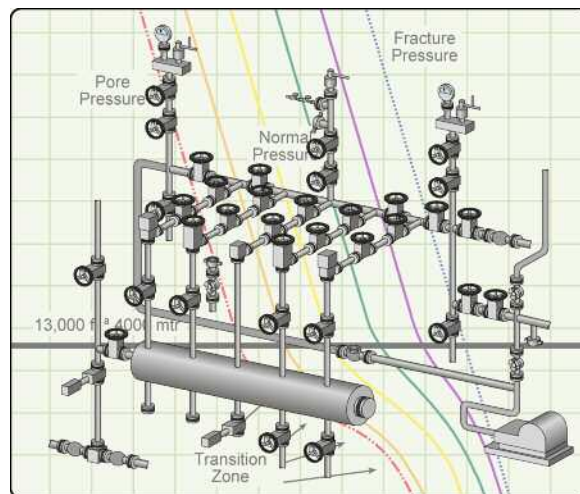
# Taking the pressure off!

## A three-step approach to effective training for HPHT drilling

By Tom Donnelly, head of marketing and sales, Aberdeen Drilling Schools Ltd

Aberdeen Drilling Schools (ADS) were pioneers and have remained at the forefront of High Pressure / High Temperature (HPHT) wells training for the past decade-and-a-half, assisting many of the major operators and drilling contractors with ensuring enhanced efficiency and safety in drilling these challenging wells. Recent HPHT training and consultancy work has been carried out for clients such as BG (Brazil and Egypt), BP (Egypt), ExxonMobil (Nigeria), Noble Drilling (Holland), Petro-Canada (Trinidad), and Shell (Brunei, Libya and Nigeria).

The difficulties and hazards associated with drilling in high pressure and high temperature (HPHT) environments are universally recognised in the industry. The unpredictable nature of the kicks, the speed with which a well can become underbalanced, requires that drillers now accept a new philosophy. The key to preventing an HPHT kick is to create an atmosphere within the operation - especially at the rig site - which enables and motivates the team involved to concentrate special attention on the small changes in surface response during the drilling of the transition section through to the target sections. The positive communication to the driller from everyone in the team monitoring returns is of the utmost priority! This enablement encourages the driller to get the well shut-in as quickly as possible at the very first indication that the well is flowing for any reason. It is no longer acceptable for HPHT wells to be flow-checked with the well open during the drilling of these pressure transition sections. Getting the well shut-in and flow-checking on the trip tank through the choke has become accepted practice in the HPHT



section of the well. Once the well is shut-in with the BOP, drilling supervisors can then assess the situation and gather the evidence and facts which enable the well to be properly controlled. It will take time to gather the evidence. What are the shut-in conditions (shut-in drill pipe pressure, shut-in casing pressure, kick tolerance)? Do we have a ballooning or supercharging problem? Are thermal effects causing the well to flow? All this information has to be analysed before a well kill plan can be implemented.

Another current key operational challenge is "choke control and response" during HPHT kicks, especially when we are using oil base drilling fluids. Toolpushers need specific knowledge and practice in order to recognise the different challenge in keeping BHP constant because of the different time delay responses in the dynamic U-tube.

ADS bases its operational HPHT training on a three-step approach:

### 1) HPHT engineering/planning workshop

Intended primarily for the operator's drilling engineers and drilling supervisors, this enables the personnel involved in the planning and supervision of the well operations to review and discuss both the generic and well/equipment-specific HPHT challenges facing them, and to review and challenge the procedures in their well programme.

### 2) Whole-crew HPHT training


A pre-spud or post-spud team event, this is an opportunity for the rig-and office-based engineering and supervisory personnel, drill crews and service company reps to communicate and raise awareness of issues relating to the HPHT environment and the well-to-be-drilled.

### 3) On-the-rig HPHT coaching

Follow-up refresher training - with an instructor conducting formal and informal sessions on the rig - is often carried out for the drill crews close to or during the critical section of the well. The ADS trainer "HPHT Coach" is on hand to:

- Highlight the problems that may be encountered in HPHT wells
- Assist in ensuring implementation of the agreed HPHT procedures
- Ensure that all the relevant rig personnel understand the importance of their role
- Encourage good communication between all the parties

For more information or to discuss ADS's HPHT training services, please call Tom Donnelly on +44 (0)1224 572709 or email donnelly@aberdeen-drilling.com



## TRAIN AT THE DEEP END!

ABERDEEN DRILLING SCHOOLS drilling instructors act as RIG-SITE COACHES to help bridge knowledge and experience gaps of Operator, Drilling Contractor and Service Company personnel

The goal

To provide practical training on the steps the rig team can take to prevent, reduce and manage well control incidents on the rig

The environment

Lost circulation, Deep Water and HPHT environments (where operating margins are smaller and kick detection more critical)

Topics include

- Kick detection
- Fingerprinting practices for early kick detection
- Riser gas handling
- Well control drills
- Gas behaviour
- Dealing with underground blowouts and hydrates
- Well kill methods and practices

The benefits

The speed and effectiveness of rig-site training in achieving operational readiness, reduced NPT and the subsequent reductions in stress, time and money

PREPARE YOUR TEAM FOR THE CHALLENGES AHEAD - CONTACT ADS NOW!

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