

Effective management of rig, people, project is key

EFFECTIVE MANAGEMENT of organizations, projects and equipment is critical to the success of every drilling project and the financial performance of every drilling company.

Two sessions at the 2002 IADC/SPE Drilling Conference, 26-28 Feb in Dallas, focus on how to manage people, equipment and relationships.

Both sessions, "Managing for Performance and Profit," are chaired by **D H Heenan, Tesco Corp** and **R D Murphy, Parker Drilling Company**.

RIG MANAGEMENT

GlobalSantaFe's RMS II system provides the tools to implement and monitor a Reliability Based Maintenance Strategy.

It allows continuous improvement through increased equipment reliability, reduced unplanned downtime and a more effective use of resources.

Equally important, the system enables the company to select equipment for new-build and retrofit projects based on maintainability, reliability and equipment life cycle cost, rather than on initial cost and performance specification alone.

In IADC/SPE paper 74465, "The Santa Fe Rig Management System," author **R McKechnie, GlobalSantaFe**, describes the system.

Maintenance standardization and optimization are critical factors in the success of any pro-active maintenance organization. Continuing developments in maintenance practices have brought a growing awareness that the implementation of a well-planned Reliability Based Maintenance Strategy can result in reduced unplanned downtime for drilling rigs and equipment.

According to the author, the most significant development for maintenance management in recent years has not been the wealth of new techniques and practices. Instead, it has been the gradual acceptance that maintenance need not be a necessary evil, but that a carefully planned, information-based maintenance strategy can be a fundamental factor in the success of the organization.

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**R McKechnie
GlobalSantaFe**

Reliability Based Maintenance techniques can achieve their full potential only if the data that are used to provide the basis for critical planning decisions are accurate and consistent.

Furthermore, meaningful performance indicators must be established at an early stage, and at all levels of the organization in order to measure the effectiveness of the strategy.

PROJECT MANAGEMENT

In IADC/SPE paper 74466, "Project Management and New Technology Combine to Provide Enhanced Drilling Performance for Drilling Shallow Horizontal Wells," the results of a multilateral horizontal well drilling program are presented.

M Sander, Nexen Petroleum Inc; R Norgaard, Tesco Corp; K Kern, Reed-Hycalog; and T M Warren, Tesco Corp prepared the paper for the conference.

It highlights results from drilling 35 multilateral horizontal wells in the Hay Field in NE British Columbia during the 2000/2001 winter drilling season. Seven rigs were used in the project to drill 84 laterals—23 triple laterals, 5 dual laterals and 8 single laterals.

The lateral length was typically greater than 3,000 ft, with laterals as long as 4,200 ft being drilled at a TVD of 1,070 ft. These wells were drilled in a very cost constrained environment, but one where the timing is critical because of the short winter drilling season.

The overall drilling project was completed 18 days ahead of schedule and C\$2.8

million under budget despite industry activity levels being at an all time high.

Project organization, the application of new drilling technology and a rather mild winter were the main factors contributing to this outstanding performance, according to the authors.

The project was planned and organized to take advantage of experience gained from the previous year's drilling program and incorporated batch-drilling techniques. Drilling contractors and service suppliers from the previous year's program were used to minimize the learning curve.

A focused effort to tailor PDC bits to the specific applications resulted in a world record bit run of over 68,720 ft with a single bit at penetration rates 50% greater than the previous year's history with roller cone bits.

A new portable push/pull machine was employed to more effectively apply WOB while directional drilling at rather long reaches relative to depth. This machine is easily installed and operates from the rig floor. It functions in conjunction with the top drive to apply up to 50,000 lb downward force to the drillstring when slide drilling.

Its use resulted in the ability to drill longer laterals and made management of the heavy weight pipe in the vertical part of the hole more efficient, the authors report.

INTELLECTUAL PROPERTY

Increasingly, intellectual property can be one of a company's most valuable assets. In IADC/SPE paper 74467, "Protection of Intellectual Property in the Oilfield," author **P L Brewer, Thomson, Moser & Patterson LLP** defines intellectual property and provides guidelines to help protect it.

The author reports that recently **Shell Exploration Company** was found liable by a jury in Houston for the asserted appropriation of technology for an offshore drilling platform. The basis for the award was patent infringement.

In today's economy, intellectual property can be a company's most valued asset.

The author explains where intellectual property comes from and how to protect it. More important, according to the author, is determining who owns the intellectual property once it is created.

PERFORMANCE MANAGEMENT

Only in the offshore drilling industry is it taken for granted that multi-million dollar work programs can be successfully undertaken on short notice with minimal planning. With a dozen balls up in the air, robust management systems will help keep them all in play.

In IADC/SPE paper 74477, "New People, New Rig—Managing Performance," author **R N Blank, Diamond Offshore Drilling Inc**, outlines systems and processes used by Diamond Offshore to meet these challenges.

Starting rigs up and/or building new working relationships is time consuming and can be tedious and unproductive if not properly managed.

The author describes The Global Excellence Management System (GEMS), a formal system of policies and procedures designed for easy reference combining the best practices of the companies that combined to form Diamond Offshore. He also reports on these projects:

- Ocean America, Trinidad—The Ocean America mobilized from the Gulf of Mexico to Trinidad for a 2-well program. Techniques used by the crew integrated a high performance team that successfully met the challenges presented by a previous rig's safety record;
- Ocean Confidence startup—Meshing of the drilling contractor's and operator's management systems helped set new safety and rig performance standards;
- Ocean New Era, Subsea Mud Lift Drilling—Drilling with dual gradient mud weights requires new equipment and a new way of thinking.

GRADE POINT AVERAGE

Public examination of actual drilling performance data and trends is curiously lacking, according to the author of IADC/SPE paper 74478, "Core Competency, Core Business, and Drilling Performance." **T S Proehl, Triton Engineering Services Company** prepared the paper for the Drilling Conference.

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**T S Proehl
Triton Engineering Services**

The author defines two categories of drilling actors: risk-management contractors and best-efforts operators. He also defines the terms "core competency," "core business," and "drilling performance."

A cardinal performance grading system for wells, based on grade-point averages used in schools, is objective, simple and universally applicable, the author reports.

The total well grade is based on planned objectives versus actual accomplishments, planned versus actual drilling operations time, and planned versus actual expenditures.

Two sets of 50 wells each were graded. One set was drilled on a risk-management basis, the other on a best-efforts basis. On average, the risk-management wells graded 2.66/4.00 and the best-efforts wells graded 1.60/4.00, the author reports.

The composite risk-managed well was 1.81% over planned days and 2.03% over planned dollars. The composite best-efforts well was 26.57% over planned days and 2.37% over planned dollars.

Personnel, technology, process issues, and economic theory are considered as root causes of the performance difference. The author concludes that wells drilled by organizations whose core competency is a core business grade higher than those drilled by organizations whose core competency is not a core business.

The evidence also supports the conclusion that risk-management contractors plan and drill wells more efficiently than best-efforts operators. Most of the performance differential is explained by economic risk and reward theory.

BRAIN DRAIN

The brain drain in the upstream oil and gas sector will have far-reaching implications. After nearly 20 years of steadily eliminating jobs, upstream producers and service companies may not have the manpower to supply the world's growing demand for oil and gas.

That is a conclusion of IADC/SPE alternate paper 74468, "Combating Brain Drain with Digital Technology and Knowledge Management." **P R Springer, Sapient Corporation**, prepared the paper.

Between the continued job cutbacks and rapidly aging workforce, the upstream sector is on track to lose 2/3 of its knowledge workers within the next 7 years.

If the brain drain continues at its current pace, by the year 2007, E&P companies' ability to make wise decisions will drop to 40% of its current capacity, crippling the industry's ability to make critical business decisions and prosper.

The ultimate impact could lead to upstream companies not having the manpower to supply the world's growing appetite for oil and gas, according to the author.

While totally eliminating the implications of the brain drain is unrealistic, there are concrete things that E&P companies can do to minimize its impact.

Significant industry knowledge exists within the current and recently retired workforce. The key is to capture and transfer this knowledge in a meaningful way to new hires and less experienced workers before it walks out the door.

The author suggests that, using digital technology, companies can design knowledge management and scenario-based simulation learning systems.

Such systems can enable persons wanting to gain perspective, context, or information about a problem to play out an interactive scenario of that problem. Performance is matched against that of a recognized expert who can "coach" their solutions and/or provide feedback on what went well and what needs improvement.

This advanced simulation learning system can incorporate text, video, sound and other rich media elements.

This will have the secondary effect of

demonstrating advanced technological capabilities to a potential workforce of young technology-savvy students and is a critical step towards changing the industry's image with younger generations, according to the author.

E&P companies that deploy these systems with the same rigor as other mission critical projects will generate measurable business value by:

- Reducing the current 7-year learning curve;
- Reducing costly mistakes;
- Increasing the productivity of knowledge workers;
- Enhancing the flow of information across sector boundaries.

BETTER DATA FLOW

E&P companies are now putting more focus on collaborative asset teamwork to speed and improve decision-making involved with developing oil and gas fields.

To facilitate such collaboration, E&P companies are adopting shared, integrated, IT technology to enable multidisciplinary teams to engage in improved workflow processes across all phases of the oil field life cycle.

IADC/SPE alternate paper 74480, "WITSML: T2B for the Oilfield," provides a brief review of techniques and shows why an internet based solution is required for well construction management in the 21st century.

The paper was prepared by **J Holt, BP plc; J Haarstad, Statoil; J A Shields, Baker Hughes; J P James, Schlumberger; and D D Seiler, Halliburton Energy Services.**

Much of the data needed to feed today's workflow processes can be shared between service companies and E&P companies during the planning and execution phases of the wellbore construction process.

The "right time" seamless flow of these data between operators and service

companies will speed and enhance decision-making, according to the authors.

There have been a number of solutions tried over the past 20+ years ranging from WITS to the more recent use of DART (Data Automation in Real Time) and Res3D. This WITSML initiative has been sponsored by E&P and service companies and incorporates lessons learned from the previous solutions.

Internet compatible data will facilitate new and innovative workflows and markets across the entire oil field, according to the authors. The WITSML functional specification requires:

- Ability to transfer oilfield data between different vendors' software systems;
- Standard definitions of oilfield data objects;
- Objects that are extensible and self-defining;
- Real-time and batch mode;
- Ease of implementation. ■