### A Century of Achievement

#### A REPUTATION FOR EXCELLENCE

<table>
<thead>
<tr>
<th>Operations in 10 states, including all major U.S. onshore basins, South America and the Middle East</th>
<th>Land rigs in the U.S.</th>
<th>International land rigs</th>
<th>Offshore platform rigs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>299</td>
<td>31</td>
<td>8</td>
</tr>
</tbody>
</table>

- **Employees**: ~10K
- **Customer Satisfaction**: #1 in total customer satisfaction 11 years in a row
- **Performance**: Outperformed OSX 8 of the past 10 years
- **Revenue**: $2.5B Fiscal 2018 revenues
- **Dividends**: $1.5B Returned to shareholders in past 10 years through dividends
- **Dividend Growth**: 47 Years of increasing dividends (~5% dividend yield)

#### Founded in 1920,

Helmerich & Payne (H&P) (NYSE: HP) is the oil and gas industry’s most trusted partner in drilling productivity and technological innovation. Through its subsidiaries, H&P designs, fabricates and operates high-performance drilling rigs in conventional and unconventional plays around the world. H&P operates with the highest levels of integrity, safety and innovation to deliver superior results for stakeholders.

#### A Winning Strategy

- Execute as the dominant U.S. land driller
- Grow international business opportunistically
- Maintain cash flow-generating offshore exposure
- Continue to lead industry and bring value to customers through technology and innovation
- Maintain and build upon solid financial foundation
- Adapt to changing market conditions

#### H&P Technologies: Extracting Higher Value from Shale Assets

Our H&P Technologies segment drives the development of advanced technologies and directional drilling automation solutions through our Value-Driven Automation™ platform.

- Recognized as industry leader in drilling and technological innovation
- Provides leading technology solutions for wellbore quality and placement
- Acquisitions of Motive, MagVAR and AJC create a powerful platform and compelling value opportunity for E&P companies

#### Leading Market Share:

- 21% of U.S. Land Fleet*

Uniform fleet is cost-advantageous and enables people, equipment and technology to reach maximum efficiency, providing consistent and reliable operations in increasingly complex basins

*As of July 2019
MOTIVE and MagVAR remain available to all E&P operators and directional drilling service providers regardless of which drilling rig contractor is used.

AutoSlide

H&P AutoSlide automates the control of surface equipment and steerable mud motors to optimize sliding in deviated and horizontal well drilling.

MOTIVE

Improving Wellbore Quality
- Software enables drilling of higher quality wellbores with a scalable, repeatable, data-driven platform approach.
- The Bit Guidance System improves directional drilling economics by:
  - Lowering well construction costs
  - Reducing future lifting costs
  - Increasing hydrocarbon production potential
- Implemented on wells across all of the major U.S. shale plays and Canada
- Multiple U.S. Patents

Improving Wellbore Accuracy
- MagVAR software increases surveying accuracy by 50-60%, increases horizontal well economics and reduces risks associated with uncertainty, including:
  - Reduced oil recovery
  - Well interference
  - Frac hits
  - Poor geological models
- Utilized by 60 E&P companies
- Nearly 8,500 wells corrected

Motive and MagVAR software increases surveying accuracy by 50-60%, increases horizontal well economics and reduces risks associated with uncertainty, including:
- Reduced oil recovery
- Well interference
- Frac hits
- Poor geological models

Utilized by 60 E&P companies
- Nearly 8,500 wells corrected

<table>
<thead>
<tr>
<th>MOTIVE RESULTS</th>
<th>WITHOUT MOTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Accuracy</td>
<td>Poor drilling accuracy</td>
</tr>
<tr>
<td>More time in pay zone</td>
<td>Missed targets/pay zones</td>
</tr>
<tr>
<td>Consistent Practices</td>
<td>Increased tortuosity</td>
</tr>
<tr>
<td>Better hole quality</td>
<td>Poor hole quality</td>
</tr>
<tr>
<td>Less drilling time</td>
<td>Low rate of penetration</td>
</tr>
<tr>
<td>Improved/enhanced recovery</td>
<td>Stranded hydrocarbons</td>
</tr>
<tr>
<td>Reduces Human Error</td>
<td>Directional driller errors</td>
</tr>
<tr>
<td>Converting Art to Science</td>
<td>Increased rod wear</td>
</tr>
<tr>
<td>Decreased Lifting Costs</td>
<td>Decreased rod wear</td>
</tr>
<tr>
<td>Fewer Tool Failures</td>
<td></td>
</tr>
</tbody>
</table>

Standardizes highest quality well paths
Optimizes slide execution with no human dependency
Reduces risk and variability by making multiple corrections in real-time

Traditional Directional Drilling Challenges

<table>
<thead>
<tr>
<th>MOTIVE RESULTS</th>
<th>WITHOUT MOTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Accuracy</td>
<td>Poor drilling accuracy</td>
</tr>
<tr>
<td>More time in pay zone</td>
<td>Missed targets/pay zones</td>
</tr>
<tr>
<td>Consistent Practices</td>
<td>Increased tortuosity</td>
</tr>
<tr>
<td>Better hole quality</td>
<td>Poor hole quality</td>
</tr>
<tr>
<td>Less drilling time</td>
<td>Low rate of penetration</td>
</tr>
<tr>
<td>Improved/enhanced recovery</td>
<td>Stranded hydrocarbons</td>
</tr>
<tr>
<td>Reduces Human Error</td>
<td>Directional driller errors</td>
</tr>
<tr>
<td>Converting Art to Science</td>
<td>Increased rod wear</td>
</tr>
<tr>
<td>Decreased Lifting Costs</td>
<td>Decreased rod wear</td>
</tr>
<tr>
<td>Fewer Tool Failures</td>
<td></td>
</tr>
</tbody>
</table>

Complete Solution for Optimized & Highly Accurate Wellbore Placement

<table>
<thead>
<tr>
<th>Regulatory</th>
<th>Improved Performance/Enhanced Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased wells within boundaries</td>
<td>Reserve adds</td>
</tr>
<tr>
<td>Reduced collision risk for future in-fill drilling</td>
<td>Recovery factors</td>
</tr>
</tbody>
</table>

HPTech.com
WHY?

CONTEXT
In recent decades, more and more technical knowledge has been transferred from operators to major service companies. This led to an unfavorable technical dependency.

SOLUTION
DrillScan provides independent technology using advanced and proven models.

BENEFITS
• Improve well integrity management through advanced simulations
• Prevent dramatic well collisions and increase production with advanced survey management
• Improve drilling performance using unique 3D Bit/BHA models
• Reduce well cost by choosing adequate equipment
• Avoid expensive drill string failures
• Reduce NPT

WHAT?

MISSION
support the operator with tools to regain technical ownership, from the standard well planning process to highly sophisticated drilling optimization.

SOFTWARE
Develop three drilling engineering software platforms.

WellScan®: Well construction engineering:
• Well planning: Trajectory design, anticollision
• Directional drilling: BHA and bit design
• Drill string mechanics: Torque and drag and buckling
• Dynamics: Critical RPM, stick-slip, whirling
• Well integrity: Casing wear, casing design, standoff
• Survey Management: BHA sag, local doglegs
• Drilling hydraulics: ECD, swab and surge pressure losses

LiveScan®: Real-time drilling simulations

BitScan®: PDC Bit Design/Simulation Performance

TRAINING
Provide customized drilling engineering training sessions:
• Theoretical background, scientific models
• Use of the software, case studies

For drilling and completion engineers, managers, supervisors, superintendents, consultants.

Research and Development
Solve complex engineering challenges
• Continuous improvement of scientific models
• Lab tests and full-scale field validation
• Unique models
• Sponsored by major operators
• 30+ scientific publications

SERVICES
Provide engineering services to the drilling industry using WellScan®, LiveScan® and BitScan® software, experienced engineers and skilled scientists.

Engineering studies:
• Well design and reviews
• BHA and tubular string design
• Stuck pipe and DHT failure investigation
• MSE and drilling performance
• Survey management and QAQC
• Casing wear and casing standoff calculations
• Drilling Technology Screening Process (DTSP)
• Independent benchmarking of DHT

Consultancy: Deploy experts and engineers on rig site or customer’s office with advanced software.

WHO?

Independence - Excellence - Experience

Developers and ITs

PhDs and Scientists

Drilling Engineers

WHERE?

International Presence

HQ: IT and R&D
Villeurbanne, France

North and South America
Houston, US

Europe and Africa
Pau, France

Asia and Middle East
Abu Dhabi, UAE

HPTech.com
Customer challenge: When drilling in congested fields, there is a significant danger of catastrophic anticollision with an existing (offset) wellbore. Apart from the economic damage of destroying two valuable wellbores, a collision may also result in a health, safety and environmental event. Operators therefore maintain anticollision policies aimed at preventing such collisions.

These policies state that new wellbores must maintain a statistical Separation Factor (SF) between existing wellbores. To increase the SF between a planned wellbore and its offset wells, the new wellbore can sometimes be moved or shortened. However, any such modifications of the well plan can result in sub-optimal drainage, stranded reserves and sub-optimal field development.

Instead of moving or shortening the planned wellbore, a more economical approach is to fundamentally increase accuracy with which the new wellbore and its offset wells are surveyed by enhancing and correcting measurements. As a statistical measure, SF takes the surveying accuracy into account to achieve that goal. The more accurately the existing and new wellbore positions are surveyed, the higher the confidence in their position and the higher the resulting statistical SF between the old and new wellbores to avoid catastrophic collision.

Therefore, prior to moving a new wellbore to a sub-optimal position, it is advisable and has become widespread practice in US Land, to first increase the wellbore surveying accuracy as much as possible by employing enhanced survey management techniques.

Well-established techniques of IFR, and advanced MWD analytics corrections strongly reduce the wellbore placement uncertainty by up to 60%. Applying these techniques will significantly increase the SFs between new well drilled in congested fields.

With increased SFs, fewer wells will require dispensations and less collision risk will be encountered. Thus, increased SFs further improve the safety in-fill drilling campaigns such a congested environment such as the Permian basin.

CASE STUDY

MEETING CUSTOMER CHALLENGES: IN-FIELD REFERENCING (IFR) AND ADVANCED MEASUREMENT WHILE DRILLING (MWD) ANALYTICS
Main field geomagnetic models used in standard MWD do not capture local crustal anomalies of the geomagnetic field. IFR is a method of predicting the true magnetic field at a specific geographic location by accurately mapping local variations in the natural field caused by magnetic minerals in the Earth’s lower crust.

It is used to enhance MWD surveying by providing a highly accurate reference frame for azimuth calculation. IFR further defines the dip and total field strength, enabling better survey quality control. IFR is also a prerequisite for advanced MWD analytics corrections.

Advanced MWD Analytics is a method of correcting MWD surveys for common sources of error. These include external magnetic interference from the drill string and magnetized mud, as well as internal sensor errors, such as biases, scale factors and misalignments. By comparing the magnetic and gravity measurements of an MWD survey set against the reference values predicted by an IFR model and Global Acceleration Reference Model (GARM), systematic measurement errors can be resolved for the MWD accelerometers and magnetometers.

This enables a more accurate inclination and azimuth to be calculated from the corrected raw MWD sensor measurements. This process greatly reduces potential error from poor instrument calibration, magnetic drill string interference, toolface dependent misalignments and magnetic mud.

Advanced MWD survey corrections can be performed operationally while drilling to ensure the well is drilled as accurately as possible. Surveying professionals at the rig site upload MWD surveys into a web application after each survey is taken.

The survey data is automatically validated through independent quality checks to prevent clerical mistakes and identify gross errors. Survey quality engineers with specialized training and tools evaluate the MWD data from a remote operating center and correct for observable systematic errors. Surveys are re-calculated from the corrected data and posted to the rig web interface for steering and distribution.

<table>
<thead>
<tr>
<th>Lateral Uncertainty at TD</th>
<th>MagVAR</th>
<th>MWD</th>
<th>MWD (IFR)</th>
<th>MWD (IFR + MSA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastward</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
</tr>
<tr>
<td>10,000</td>
<td>345</td>
<td>289 (-16%)</td>
<td>145 (-58%)</td>
<td></td>
</tr>
<tr>
<td>Southeastward</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
</tr>
<tr>
<td>10,000</td>
<td>300</td>
<td>233 (-22%)</td>
<td>134 (-55%)</td>
<td></td>
</tr>
<tr>
<td>Southward</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
</tr>
<tr>
<td>10,000</td>
<td>229</td>
<td>131 (-43%)</td>
<td>117 (-49%)</td>
<td></td>
</tr>
</tbody>
</table>

* Certain requirements must be met to achieve full reduction in uncertainty.
CASE STUDY - LATERAL SPACING

Operator pad drilling horizontal wells with multiple surface locations on same pad. Ideal lateral spacing for hydrocarbon extraction was not feasible due to failing anticollision rules of SF < 2.0 approximately 2,700ft MD from planned well TD. Operator could not drill under SF < 2.0 and would have needed to increase spacing.

Used operationally, IFR and advanced MWD analytics increased SF to > 2.0 for the entire length of the lateral.
CUSTOMER CHALLENGE

Tighter well spacing, multi-wellpad designs and longer laterals result in drilling conditions with higher anticollision risk and the need for greater positional accuracy. Using highly accurate In-Field Referencing (IFR) models will improve anticollision separation factors (SF) by as much as 40% as compared to main field magnetic models used in standard MWD surveying. This not only reduces collision risk, but also enables more accurate well placement. IFR does NOT require additional surveying tools, personnel or rig time!

SOLUTION: IN-FIELD REFERENCING (IFR)

IFR is an industry recognized and low-cost method for reducing wellbore positional uncertainty associated with MWD surveying. Applying IFR can significantly increase the SFs between new wells drilled in congested fields. Higher SFs will require fewer dispensations and reduce risk of well to well collision or lease line infractions. Reducing positional uncertainty also enables future in-fill drilling campaigns in congested fields.

Main field geomagnetic models used in standard MWD do not capture local crustal anomalies of the geomagnetic field. IFR is the industry leading method for predicting the magnetic field direction accurately for a specific geographic location and time. IFR relies on independently acquired measurements of the local magnetic field to accurately map regional variations caused by magnetic minerals in the Earth’s lower crust.

IFR improves MWD surveying by providing the most accurate reference direction possible for azimuth calculation. IFR also provides more accurate estimates for magnetic dip angle and total field strength, which enables more precise MWD survey quality control.
The MOTIVE® Bit Guidance System leverages the computational horsepower of modern processors coupled with advanced self-learning algorithms to automate directional drilling decisions in the operator’s best interests and much better than even the most experienced directional drillers.

The Bit Guidance System continuously analyzes millions of potential well paths to get back to plan, and then selects the highest value option for the operator. This real-time analysis includes determining the costs related to drilling speeds associated with rotating or sliding, risk associated with induced wellbore tortuosity, and the possible loss of future production. The human mind simply can’t consider all these factors with any precision when making steering decisions.

In contrast, the system is able to continuously perform all of these calculations, and more, to provide explicit, easy to follow, turn-by-turn bit navigation guidance in realtime. The Bit Guidance System is also able to modify these instructions on-the-fly based on the driller’s current performance, a far more accurate forecast of the bit location, and automated detection of possible target changes.

The Bit Guidance System is also a state-of-the-art secure collaboration platform for the driller, the geologist, field coordinators, and the asset manager. The system provides complete transparency to all past, current, and future directional drilling activities for personnel on the rig, in remote operations centers, and anywhere else with an internet connection.

A study comparing dozens of wells drilled with the Bit Guidance System vs. wells drilled without the system in four different areas and with four different operators show an average reduction of drilling costs of $12,166/day and an increase in hydrocarbon production potential of $16,571/day. The daily cost of deploying the Bit Guidance System is just a fraction of the value of these proven benefits.

**MOTIVE proven results**

**REDUCED DRILLING TIME**
The MOTIVE Bit Guidance System helps drillers to consistently reduce average drilling time by over 15%, significantly reducing drilling costs.

**LOWERED RISK**
MOTIVE reduces dogleg severity and the associated risks related to stuck pipe, casing running and/or production problems.

**INCREASED HYDROCARBON RECOVERY**
MOTIVE has proven to deliver twice the accuracy of traditional directional drilling tools leading to increased hydrocarbon recovery.

---

**WITH & WITHOUT THE MOTIVE® BIT GUIDANCE SYSTEM DRILLING FEET/DAY**

---

**TREMENDOUS PROVEN VALUE FROM USING THE MOTIVE® BIT GUIDANCE SYSTEM**

---

**Value/day [Production Potential Increase]**

---

**Savings/day (Drilling Time)**

---

HPTech.com
Horizontal well drilling has been one of the keys to unlocking the unprecedented growth in unconventional oil and gas resources. Drilling horizontal wells is expensive and risky, about 10 times the cost of drilling conventional resource plays. One of the main reasons costs are high is because the complex geology associated with unconventional plays makes it difficult for directional drillers to follow the path defined by geologists, geophysicists and reservoir engineers.

Continuous corrections are required to follow that path and to mitigate divergence caused by geologic variability of hardness and orientation. For operators depending on traditional directional drilling services, this geologic complexity can be too great for the driller to react to quickly. This leads to both higher drilling costs and to reduced hydrocarbon recovery. The Bit Guidance System drastically improves the performance of directional drilling in horizontal wells.