

Dennis Denney, JPT Technology Editor



**Fig. 1—Baker Oil Tools' Equalizer reservoir-optimized-completion system.**

### Reservoir-Optimized Completions—

Baker Oil Tools' Equalizer reservoir-optimized-completion system helps to maximize hydrocarbon recovery. To delay water or gas coning in horizontal wells, the system uses an extended-longevity well screen and an inflow-control device as a restrictive element. The well screen provides sand control, and it resists plugging and erosion with three concentric layers of media—a protective shroud, a single-layer vector-filtration membrane, and an inner jacket (**Fig. 1**). The outermost layer of the screen is a vector shroud that provides erosion protection under turbulent-flow conditions. Within the shroud, the single-layer vector membrane has uniform pore-throat openings and an inflow area of approximately 30%, which is 10 times that of a typical prepacked screen. The inner jacket and drainage layer protect the overlying vector-membrane layer against high differential pressure. These features combine to extend screen life to eight times that of a standard prepacked screen. The



**Fig. 2—Thermo Scientific's AutoPILOT PRO gas-flow computer.**

inflow-control device uses a restrictor element to distribute pressure along the entire length of a wellbore. Thereby, local production rates at any point along a wellbore can be controlled as a function of both the average drawdown pressure and the average productivity of a well. Operator-supplied formation data are used to model and configure individual systems to attain optimal pressure drop and flow rates. The system can be used in a variety of wellbore conditions, including those that require viscous fluid, kill-pill cleanup, or multiphase flow. The system has attained individual lateral-installation lengths of more than 13,000 ft.

For additional information, visit [www.reservoiroptimizedcompletions.com](http://www.reservoiroptimizedcompletions.com).

### Flow Computer and Transmitter—

Thermo Fisher Scientific has introduced two solutions for the transmission and production of natural gas, its AutoPILOT PRO flow computer and its AutoMITTER PRO smart multivariable transmitter for natural-gas measurement. The gas-flow computer (**Fig. 2**) is scalable from a single-run-measurement application to multiple runs with full-station control, enabling use of a single platform that can be expanded as needed. Once configured, the flow computer automatically performs tasks that typically need to be programmed, including flow calculations, alarms, and

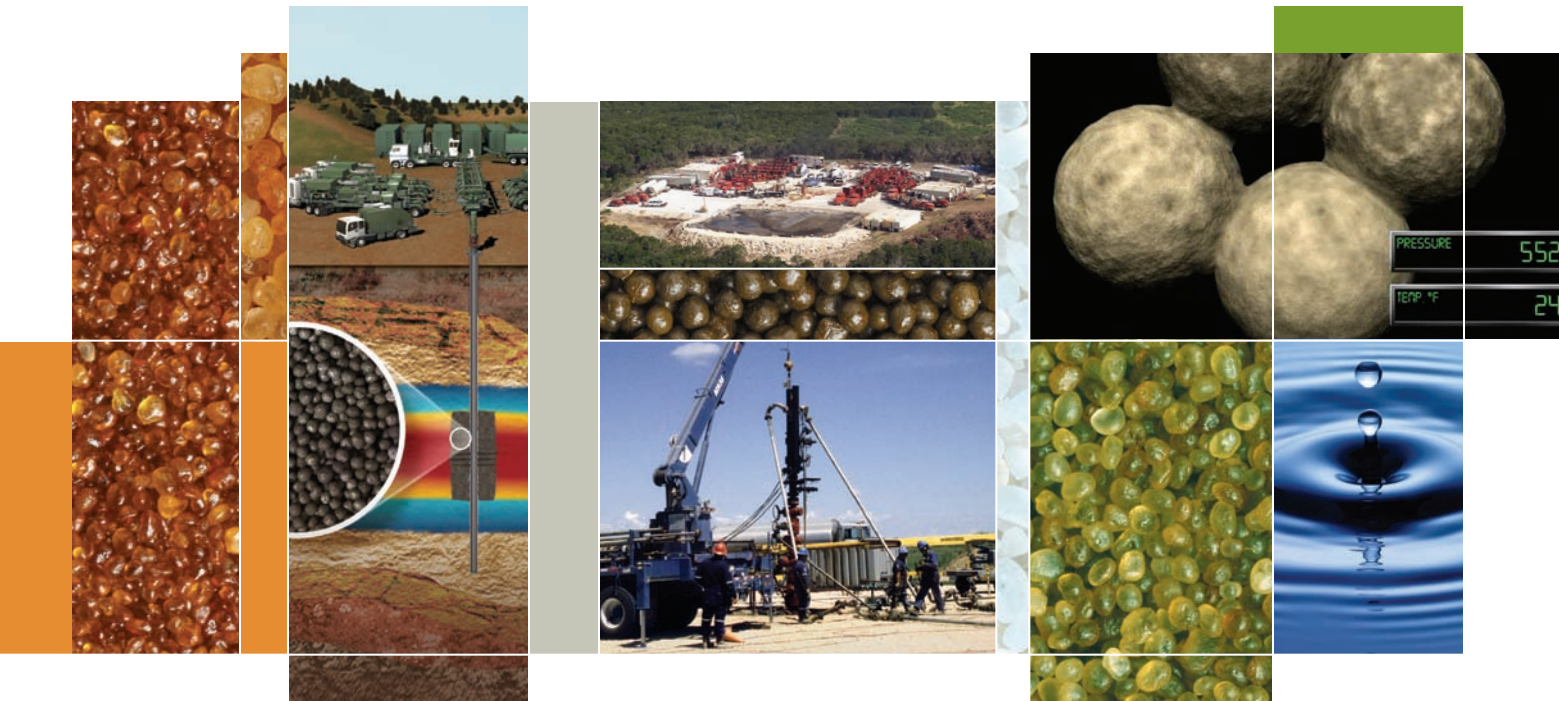
input/output sampling. The advanced plunger-lift algorithms have been shown to increase production. Once the software's plunger-lift algorithm learns the flow characteristics of the well, advanced self-optimizing methods take effect to ensure maximum results are achieved over time. The system is capable of simultaneous multiplunger support and control, and provides real-time production data and troubleshooting information through remote monitoring to minimize system downtime and maximize staff productivity. As many as 16 expandable analog inputs can be scaled to meet a wide range of measurement and control needs without platform upgrades. It interfaces with multiple input devices, including differential-signal devices (e.g., orifice, stacked orifice, V-cone, and verabar), and with linear-signal devices (e.g., turbine, autoadjust turbines, and ultrasonic). The processor operates in a temperature range of 40 to 85°C. The new transmitter integrates with the flow computer. The new design measures differential pressure, static pressure, and temperature, eliminating the need for separate transducers. The transmitter is integrated into the flow-computer motherboard, eliminating the need for an external card and simplifying integration with other gas-flow computers. The highly accurate temperature measurements are within 1°C for ultrasonic and other temperature-sensitive applications. The transmitter has differential- and static-pressure accuracy of up to  $\pm 0.075\%$ .

For additional information, visit [www.thermo.com](http://www.thermo.com).

### Predicting Pore Pressure—

Geo-Mechanics International has released its GMI PressCheck, a PC-based software package designed to predict pore pressure and fracture gradient. Tools include rapid import, manipulation, and combination of wireline-logging data. The software allows the user to smooth and filter log data and perform numerous calculations from the log data. Tools enable determination of overburden density and compaction

# Improve Your Fracturing Treatment Results with these Innovative Technologies.



## Fracture Diagnostics Service

A non-radioactive alternative to conventional tracers, providing an easier and safer way for operators to optimize fracture treatments and improve results.

### PropTrac H Benefits:

- Proppants with a built-in tagging material in the resin coating provide more accurate results
- Logs can be run as often as desired during the life of the well

## Extreme Resin Technology Proppants

Designed specifically for extreme HPHT fracturing environments.

### XRT Ceramax Benefits:

- Highest fracture flow capacity in the industry
- Proppant flowback control even under extreme conditions utilizing Stress Bond™ (SB) technology

## Waterfrac Proppant Technology

Field proven, partially cured resin coated proppants designed specifically for waterfracs.

### Prime Plus Benefits:

- Superior “real-world” fracture flow capacity compared to uncoated sands, tempered sands, and uncoated ceramics
- Eliminates proppant flowback – the only partially cured waterfrac proppant available

Get the Results You Expect.<sup>SM</sup>

Visit [hexion.com/oilfield/results](http://hexion.com/oilfield/results) for more information.

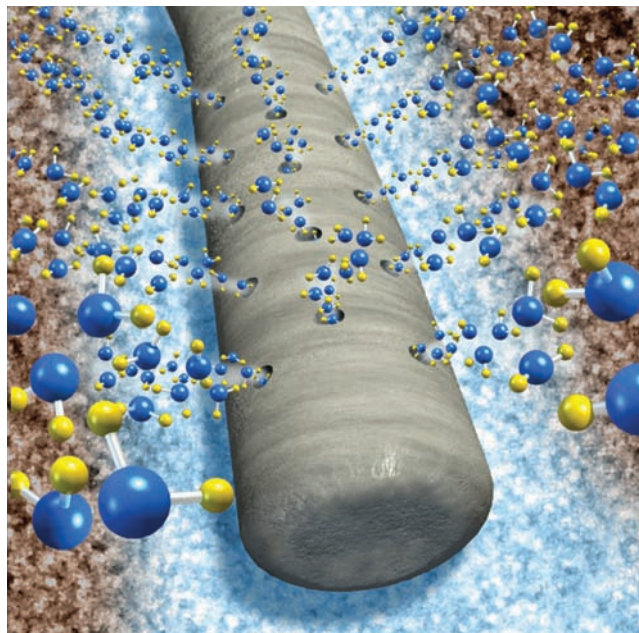
**HEXION**<sup>TM</sup>

Hexion Specialty Chemicals, Oilfield Technology Group, Houston, TX USA +1 281 646 2800  
Fracturing photos courtesy of BJ Services Company and Halliburton.  
© 2008 Hexion Specialty Chemicals, Inc. ®, <sup>SM</sup> and <sup>TM</sup> Licensed trademarks of Hexion Specialty Chemicals, Inc.

[hexion.com/oilfield](http://hexion.com/oilfield)



**Fig. 3—TDW Offshore's SmartPlug high-pressure-pipeline isolation tool being delivered to the Enterprise Independence Hub platform.**



**Fig. 4—Long-term zonal isolation for carbon-sequestration or CO<sub>2</sub>-injection wells is assured with Schlumberger's compatible-cement formula.**

trends on the basis of sonic-, density-, and resistivity-log data. Centroid- and buoyancy-effect analyses enable checking those effects on the pressure profile. These effects can cause significant lateral changes in the pressure, especially if hydrocarbons are present. The software is an integral part of the company's suite of software for building geomechanical models and for predicting wellbore stability.

For additional information, visit [www.geomi.com](http://www.geomi.com).

**Flex-Joint Isolation**—TDW Offshore Services completed a key subsea flex-joint isolation on the Independence Trail natural-gas pipeline in the Gulf of Mexico. The isolation operation allowed critical repairs to be made on the flex-joint assembly of the 20-in. export riser on the Enterprise Independence Hub platform (in Mississippi Canyon Block 920, 8,000-ft water depth) that had begun to leak in April 2008. The hub platform has capacity to handle more than 10% of the natural gas transported from the Gulf of Mexico. The flex joint, approximately 85 ft below sea level, allows the riser to withstand movements of the platform. To facilitate the riser repair, the flex-joint assembly was isolated with a piggable, tetherless, SmartPlug isolation tool. A double-

block module, 20-in. tool was installed temporarily in early May (Fig. 3). The tool was launched and pigged (pumped by water) into the riser just below the flex joint. This method allowed maintaining pipeline pressure downstream of the flex joint. With ambient pressure above the flex joint, divers then replaced the O-ring gasket subsea and then, after resealing, the entire riser was successfully pressure tested. Gas flow resumed from the production fields through the riser in 10 days.

For additional information, email [mark.roberts@tdwilliamson.com](mailto:mark.roberts@tdwilliamson.com).

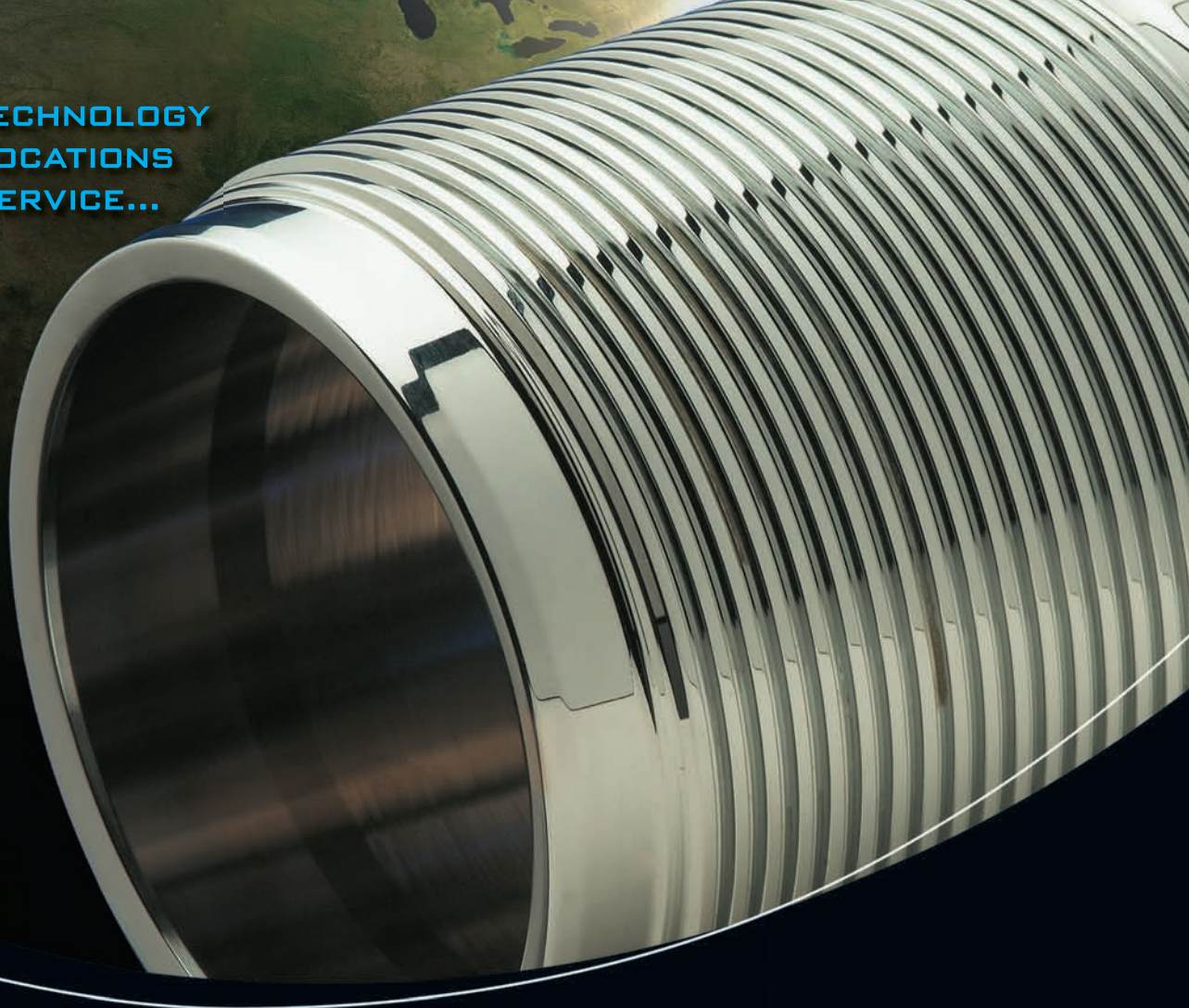
**CO<sub>2</sub>-Resistant Cement**—Schlumberger has introduced its EverCRETE CO<sub>2</sub>-resistant cement. In Portland cement, as CO<sub>2</sub>-laden water diffuses into the cement matrix, the dissociated acid (H<sub>2</sub>CO<sub>3</sub>) reacts with the free calcium hydroxide and the calcium/silicate/hydrate gel. The reaction products are soluble and migrate out of the cement matrix. Eventually, the compressive strength of the set cement decreases, and the permeability and porosity increase, leading to loss of zonal isolation. This cement is engineered to ensure long-term zonal isolation in wells with high concentrations of CO<sub>2</sub> in either wet or gaseous states. The cement system is highly resistant

to CO<sub>2</sub> attack from wet supercritical CO<sub>2</sub> and from CO<sub>2</sub>-saturated water (Fig. 4). These conditions, typically encountered in carbon-geological-storage projects or CO<sub>2</sub>-injection-well applications, cause rapid degradation of standard oilfield cements. This cement can be prepared in a standard bulk plant, and its density can be controlled for most well requirements. The system can be pumped as a tail slurry across the CO<sub>2</sub>-injection zone or used as a lead-in slurry to protect the casing string from CO<sub>2</sub> attack in front of any reservoir containing CO<sub>2</sub>, all by use of standard equipment. Extensive laboratory testing was performed under diphasic conditions (wet supercritical CO<sub>2</sub> and CO<sub>2</sub>-saturated water) up to 110°C and 280 bar. These tests demonstrated no signs of degradation.

For additional information, visit [www.slb.com/evercrete](http://www.slb.com/evercrete).

**Collaboration Software**—Petris has released its PetrisWINDS iShare collaboration software for energy teams that need to share information securely. Based on Microsoft's SharePoint platform, the collaboration software is scalable to multiple companies, multiple users, and large data sets. Applications include property-asset marketing (online data rooms), due-diligence col-

MORE TECHNOLOGY  
MORE LOCATIONS  
MORE SERVICE...



## THREE MORE REASONS WHY THE WORLD TURNS TO V & M TUBES FOR SEAMLESS PIPE AND PREMIUM CONNECTIONS

V & M ATLAS BRADFORD V & M TCA V & M TUBE-ALLOY

Energy companies throughout North America as well as U.S.-based international operators turn to V & M TUBES for the very best solutions. Now, V & M TUBES has expanded on its commitment to bring you leading technology and service by acquiring three market leaders.

**V & M Atlas Bradford** – Delivers premium OCTG connections and tubular technology; more than 50 years oilfield experience.

**V & M TCA** – Specializes in heat treatment operations and the delivery of specialty grade tubular products with a strong focus on short lead times.

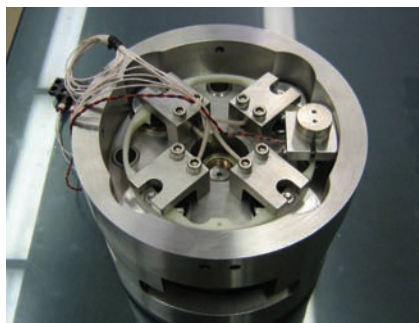
**V & M Tube-Alloy** – Produces and repairs downhole tubular accessories; specializes in complex threading and machining for custom-made orders.

More technology, more locations, more service...these are just a few of the things you get with V & M TUBES. For all the facts, visit [www.vmtubes.com](http://www.vmtubes.com) today.

VALUE BY DESIGN



VALLOUREC & MANNESMANN TUBES



**Fig. 5—The Southwest Research Institute's Semi-Active Compressor Valve for use in reciprocating compressors.**

laboration, post-merger data transfer, and sharing of project data (e.g., joint-venture production). The software can be customized for a company's data-management website with security and user settings needed for secure online collaboration. The software is offered as both a Web-hosted solution and as a customer-installed site. The hosted version allows fast setup and implementation. Project teams in diverse locations can begin using it quickly. All data are stored securely on Petris servers in a certified data center in Houston. It also may be installed inside the firewall for companies that need to manage the system themselves. The software includes features such as the option to automatically, or as needed, alert or email information changes and news to project-data-room team members; user and document-viewing- and download-tracking activity logs; text searching of folder, document, and document content; document-viewing-permission control; and bulk-file uploading for very large project data sets.

For additional information, visit [www.petris.com](http://www.petris.com).

**Compressor Plate Valve**—A production beta version of a compressor-plate valve developed at Southwest Research Institute is demonstrating long operating life in real-time field conditions. The Semi-Active Compressor Valve, developed in 2006, is installed in a high-speed compressor at a natural-gas-production site for a long-term field-performance test. Typically, reciprocating compressors use passive compressor valves, which experience high plate-impact velocities that often

result in fatigue failures and shorten the operating life. This compressor valve increases plate life by reducing plate-impact velocities. Rather than springs, the design uses electromagnets to control impact velocities (Fig. 5). The valve-plate starting motion is sensed with an electrical inductive motion sensor controlled by the electromagnets, thus eliminating the need for pressure transducers or shaft encoders to control plate motion. Four production-version valves were installed in a high-speed compressor in early April 2008 and have been performing with no valve failure as of late August, far exceeding the performance of conventional valves in place at the same location. The compressor operates under harsh conditions at 1,350 rev/min, with a compression ratio of 3:1. Each of the new valves has accumulated more than 3,000 operating hours at full load and full speed.

For additional information, email [Klaus.brun@swri.org](mailto:Klaus.brun@swri.org).

**Real-Time Monitoring**—Implicit Monitoring Solutions has introduced its Intellsite RTViewer, a real-time monitoring service that supports the company's fracturing and well-testing services. These services deliver second-by-second fracturing and well-test data directly to users anywhere in the world by way of the Internet. The service provides up to 40 channels of real-time fracturing data that can be accessed through a Web browser. The graphical interface allows each user to customize the data and select a preferred view: real-time graphs, digital readouts, or a raw-data display. The entire fracturing operation is recorded, allowing users to review different time frames and different data. The service also provides the ability to transmit data that import directly into specialized fracturing-software programs. The well-testing service is used to transfer pressure, temperature, and gas- and liquid-flow data precisely in near-real time in a potentially explosive environment. The system was designed to use a small footprint and has standalone power. The well-testing service allows selecting the preferred interval range for readings from 1- to 60-second intervals. This information is transmit-

ted on a scheduled basis through the company's satellite-communication system and is available to all personnel through the Internet.

For additional information, visit [www.implicitmonitoring.com](http://www.implicitmonitoring.com).

**Gas-To-Liquid Process**—The US Patent Office has issued a patent for a liquid-phase hydrogenation process to Synfuels International. The company's gas-to-liquid process is designed for upstream installation. Here, the gas can be converted efficiently, at its source, into an easily transportable gasoline product or an ethylene-based product. The key is the segregation and conversion step in which acetylene is separated from other constituents of the cracker effluent and is hydrogenated to ethylene by use of one of two catalysts developed by the company. The second step is absorption of the acetylene with a selective solvent. The technique is a contacting column in which the gas flows upward, counter-current to the solvent flow. Acetylene-rich solvent exits the column bottom. The remaining gases make up the column overhead, which can be a near-optimal syngas stream. Temperatures range widely and are dependent on the cooling media available. To maximize absorption efficiency, it is common to use refrigeration to lower the operating temperature to the 40 to 60°F range. Column pressures typically range from 100 to 250 psig. The heart of the technology is the third processing step—acetylene hydrogenation. The invention used here is conducting the reaction in the liquid-phase. In the liquid-phase process, acetylene-rich solvent from the absorption step is fed into a catalytic reactor along with a hydrogen source. With the proper catalyst, the acetylene can be converted with 98% selectivity to ethylene. The reactor typically operates between 100 and 300 psig pressure and at temperatures between 200 and 350°F. The liquid is separated from the product gases, cooled, and recycled to the absorption column. The resultant product gas consists mostly of ethylene, with noncondensables and a small amount of higher olefins as the balance. **JPT**

For additional information, visit [www.synfuels.com](http://www.synfuels.com).

# MOVE UP TO SMITH

## Four Reasons to Choose Smith Bits as YOUR Bit company...

### #1 People You Can Trust for Superior Service, Quality and Reliability



Smith Bits people are dedicated to superior service and continuous improvement in delivering drill bits with the world-class quality and reliability you require.

### #3 Product Performance Leadership

For the ninth year in a row, Smith Bits was recognized by Hart's E&P as the undisputed leader in drilling records for PDC and roller cone drill bits. Let Smith Bits help you achieve record-breaking performance.



### #2 Technology Leadership through IDEAS



With Smith Bits Integrated Dynamic Engineering Analysis Systems, you get superior drill bit performance without a costly time consuming trial-and-error bit design process. IDEAS lets you see how a bit will perform before it is run.

### #4 Customer Satisfaction Leadership

Independent studies by EnergyPoint Research confirm that Smith Bits leads the industry in satisfied drill bit customers. On your next well, choose Smith Bits and join the ranks of other highly satisfied SMITH customers.



[www.smith.com](http://www.smith.com)