



SEC engineers opine on reserves reporting cases



Winfrey

Representatives of the U.S. Securities and Exchange Commission shared their interpretations of agency regulations on petroleum reserves reporting at an Oct. 23 forum in Houston.

The meeting, sponsored by the Society of Petroleum Evaluation Engineers, brought together two SEC petroleum engineers and a sold-out crowd of about 120 senior-level financial and engineering personnel.

SEC engineers Jim Murphy and Ron Winfrey addressed issues involving seven actual cases disguised to protect confidentiality. Ryder Scott CEO Ron Harrell chaired the SPEE steering committee and forum.

He said, "Mr. Winfrey, Mr. Murphy and their supervisor at the SEC are to be complimented for their willingness to carefully explain the SEC position and to listen to industry concerns. The audience participation was positive affirmation of the widespread interest held by independent producers, major oil companies and national oil companies in understanding SEC regulations."

Ryder Scott engineers presented three actual cases

that were disguised to protect confidentiality.

Case 1—Ownership and Reserves Recognition

Tom Gardner, Ryder Scott engineer, discussed booking proved reserves under international agreements. He said, "The SEC and industry must work together to agree on the correct method of applying the guidelines because there is no consistent industry approach for booking reserves under PSCs (production-sharing contracts) and service contracts."

Gardner pointed out that, without a standard, industry relies on the successful efforts method, SEC Section S-X, Rule 410b. He said that this rule tends to recognize proved reserves if the contractor has the right to extract oil or gas and to take volumes in kind, has a clear mineral interest and is exposed to risk and potential reward.



*C.L. McMichael, E.D. Young, "Effect of Production Sharing and Service Contracts on Reserves Reporting," 1997, SPE Paper 37959

"Not all are needed, but the ability to book proved reserves increases as more of the four ownership indicators are in place," he said.

Gardner presented two sample risked-service contracts that had been historically controversial from a bookability standpoint. In both cases, the SEC engineers said that they would allow the booking of proved reserves because the contractors were exposed to "risk and reward." Specifically, capital was at risk.

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Case 2—One Legal Spacing

In another case study, Gardner focused on a field-development project in the Former Soviet Union. The operator planned to drill 883 wells in a 78,600-acre area over six years, he said. The geologic model, which was based on extensive well-to-well correlation and cross section work, indicated a continuous, sufficiently thick, commercially productive sand over the entire reservoir.

The depositional and geologic models agreed, said Gardner. The operator had also delineated the oil-water contact and analyzed reprocessed 2D seismic data. All 33 delineation wells tested commercial rates of oil. The operator had drilled 20-plus new wells inside the commercial-limit contour that tested at commercial rates.

The operator wanted to book all scheduled locations within the “commercially productive” contour as proved undeveloped, said Gardner. However, the SEC

engineers said that those locations could not be booked as PUDs because many were located more than one legal spacing from commercially productive wells.

Murphy and Winfrey stressed that the standard for booking locations greater than one location from existing production is “certainty of production,” not “reasonable certainty.” The latter, they affirmed, is applied to locations directly offsetting commercial producers. The SEC engineers said that they might reconsider their determination if the operator could have used pressure-test data to demonstrate connectivity of the reservoir between wells.

Case 3—Flow Testing in GOM

Bob Wagner, vice president and engineer at Ryder Scott, presented a Gulf of Mexico deepwater discovery case that focused on two SEC regulations critical to booking proved reserves:

- Under current SEC regulations, reserves cannot be booked to a reservoir that hasn’t been flow tested in a new field.
- Also, regulations limit the reservoir volume that can be booked down to the lowest known gas (LKG) seen in the wellbore, a reserves volume that may be as

little as two months of production.

Wagner showed well-log measurements indicating outstanding gas effect crossover and 31 percent porosity. He said that the log was better than those from all producing wells in a comparable horizon in a field six miles away. The well was also drilled into a seismic amplitude that extended below the LKG. This was similar to five of six wells in the closest field, said Wagner.

Relying on extensive knowledge of the area, the operator had no plans to test the well or sidetrack it down dip to test the limits of the reservoir, Wagner related. The operator planned to book the entire area as proved. The smaller partner wanted to test the well and possibly sidetrack to maximize reserves bookings under SEC regulations, said Wagner.

In response, the SEC engineers indicated that they might allow the reserves to be booked as proved without a test and to assign an area below the LKG in limited cases, if compelling evidence demonstrated reasonable certainty.

“The playing field is not level in terms of how much leeway each company gets. When the larger, operator books reserves internally, the number is buried and immature.”

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Publisher’s Statement

Reservoir Solutions newsletter is published quarterly by Ryder Scott Company LP Petroleum Consultants. Established in 1937, the reservoir evaluation consulting firm performs more than 1,000 studies a year. Ryder Scott has issued reports on more than 200,000 wells or producing entities in North America. The firm has also evaluated hundreds of international oil and gas properties involving thousands of wells. Ryder Scott multidisciplinary studies incorporate geophysics, petrophysics, geology, petroleum engineering, reservoir simulation and economics. With 117 employees, including 66 engineers and geoscientists, Ryder Scott has the capability to complete the largest, most complex reservoir-evaluation projects in a timely manner.

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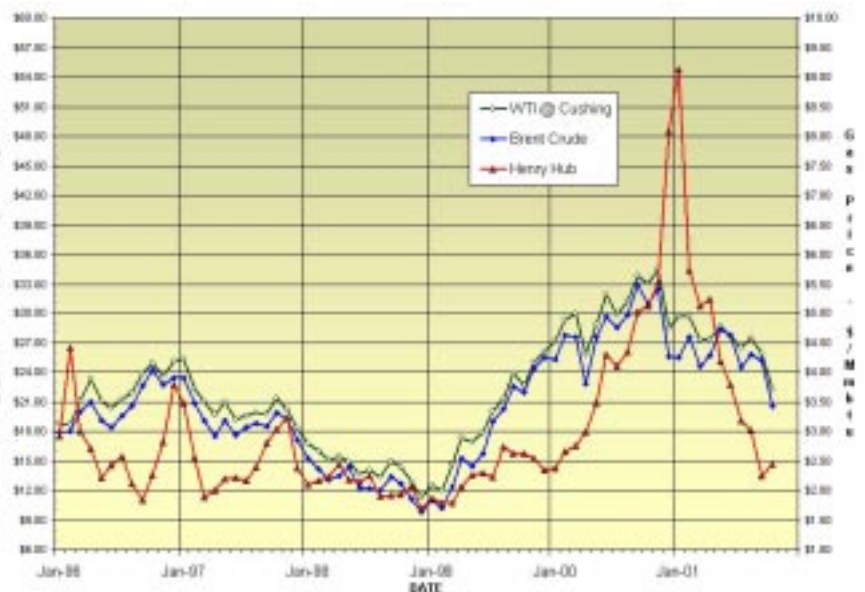
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Price history of benchmark oil and Henry Hub gas



The historical price chart shows the monthly average cash market prices for the following: WTI crude at Cushing (NYMEX), Brent crude and Henry Hub gas.

Well test data is “best evidence,” Brown tells CIM

Keith Brown, vice president and manager at Ryder Scott Canada, told a special interest group of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) that although “a lot of reserves can be determined by decline-curve analysis, a significant portion will be based on information from well tests.” To support that, he reported that Ryder Scott Canada performed property appraisals of sales packages that sold for \$400 million last year and about half of those properties were evaluated by analyzing required well-test data of some kind.

Brown spoke to the CIM G40/G52 industry group at an extended luncheon Oct. 11. G40 makes recommendations to the Alberta Energy and Utility Board for its Guide 40 on pressure and deliverability testing of oil and gas wells. The G52 group addresses electronic filing of information.

He said that most companies strike a balance between minimizing test expenses, maximizing production and increasing reservoir characterization information. “Everyone wants to cut costs, especially when prices are down. It costs money to run tests and report them,” he said.

Brown referred to a CIM/Society of Petroleum Evaluation Engineers definition that stipulates that proved reserves have to be estimated with a “high

degree of certainty.” He said, “Unless we are dealing with an infill well in a clearly defined pool or a very good analog, we may not want to categorize reserves as proved without a test.”

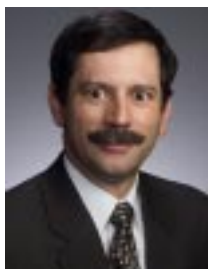
Brown cited log response as good evidence for estimating gas reserves, drill-stem testing as better evidence and four-point deliverability testing as the best. “Probably the most important information on gas wells is quality pressure and flow data,” said Brown, citing well tests, DSTs, static gradients, pressure-transient analysis and absolute open-flow tests.

He remarked that the need for working with accurate information has never been more important

than now. “These are changing times for those of us in reserves evaluations, as evidenced by the ASC (Alberta Securities Commission) task force and the inclusion of references to the CIM definitions and guidelines in security legislation. Also consider the introduction of the Canadian Oil and Gas Evaluations Handbook, including the new CIM reserves definitions and guidelines. Add to that the APEGGA (Association of Professional Engineers, Geologists and Geophysicists of Alberta) initiative under the Practice Review Board. Our responsibilities and, perhaps more importantly, our liabilities are being more clearly defined,” Brown concluded.



People



Olds

Dan Olds, formerly a manager at PricewaterhouseCoopers, recently joined Ryder Scott as a petroleum engineer. He was a manager of business restructuring services and petroleum engineering consulting at PWC for nine years. Olds specialized in property valuation projects involving acquisition packages, petroleum reserves and litigation support, expert witness testimony, annual

reserves reviews and federal tax credits. While at the PWC financial services advisory group, he also managed energy bankruptcies and restructuring.

Before that, Olds was manager of engineering and acquisitions at Wintershall Energy from 1984 to 1992. With more than 20 years industry experience, he also was a drilling and completions engineer early in his career. Olds has a BS degree in petroleum engineering from West Virginia University and a MBA degree from the University of Houston.



Hambly

Eric M. Hambly, formerly a reservoir engineer at ExxonMobil Production Co. for more than three years, also joined Ryder Scott as a petroleum engineer recently. As a project coordinator and team leader, he designed a field development program for a CO₂ flood project. Hambly also evaluated and implemented a major tight-gas horizontal drilling program. He has BS and MS degrees in chemical engineering from Brigham Young University.



Sargent

William M. Sargent, a former vice president at Ryder Scott, recently died in Bryan, TX. He retired from Ryder Scott in 1991 after 13 years as a petroleum engineer. Sargent will be missed greatly by Ryder Scott and by his friends and colleagues in the industry.

Reserves management system brings standardization to Kufpec

Ryder Scott conducts more than 1,000 studies a year and has worked with a wide variety of reserves systems. "In our experience, we've seen what works and what doesn't," said Ron Harrell, CEO. "Companies who would like to examine their reserves process can benefit from Ryder Scott's expertise."

Kuwait Foreign Petroleum Exploration Co. (Kufpec), the state-owned multinational E&P company of Kuwait, has just finished implementing a reserves management system (RMS) designed by Ryder Scott. "Our independence was brought to bear on the project," said Jeffrey Wilson, Ryder Scott engineer in charge of the project. "System development was not influenced by software vendors. Rather, the development rationale was based on our independent audit of the Kufpec processes relative to overall business goals."

Built into the RMS is a mechanism to provide Kufpec management with early warnings of the potential for significant reserves changes to a field. "Management now has the necessary information ahead of time to offset declining rates in one field by timing increases in another field," said Wilson. "By scheduling the startup of new recovery projects and adjusting production schedules, Kufpec can avoid erratic annual swings."

"All too often, we see an office, group or even individual engineers using programs and methods that are different from other individuals in the same company."

— Jeffrey Wilson

The RMS establishes company-wide standardization of methods and tools for managing reserves. "Kufpec's situation was similar to many other companies seeking more integration among staff engineers working different properties. All too often, we see an office, group or even individual engineers using programs and methods that are different from other individuals in the same company," said Wilson. Under the new system, management can conduct field-to-field



A Ryder Scott onsite team worked with Kufpec. From left are Ron Harrell, CEO at Ryder Scott; Alan Frison, engineer at Ryder Scott; Abdullah Al-Nibari with Kufpec; Jeffrey Wilson, engineer at Ryder Scott; and John Hodgkin, executive vice president at Ryder Scott.

comparisons knowing that consistent evaluation methods have been used.

To begin its investigation, Ryder Scott conducted several meetings with Kufpec personnel at all levels to determine business objectives and goals to be accomplished with a new reserves system. Kufpec was also asked to prioritize desired system characteristics. The company ranked flexibility, reliability, efficiency, automation and cost relative to one another.

Each software program offers specific advantages and disadvantages over competing programs. "We had to consider the tradeoffs in one system vs. another. For instance, a more flexible system can handle more situations, but at the same time, it may be less automated and user friendly," said Wilson. Ryder Scott also identified any other software constraints, such as existing programs or databases, so that integration issues could be analyzed.

The firm considered a variety of commercial software programs. "Merak (Projects Ltd.) and Landmark (Graphics Corp.) each offer fairly complete program packages, but many other programs, including our own CashFlow program, may be more appropriate depending on client needs," said Wilson. Ryder



Ryder Scott mentored Kufpec personnel in SPE/WPC reserves and resources categories by conducting seminars and training classes.

Scott is capable of integrating its proprietary CashFlow application with commercial applications and using custom database and application programming.

Commercial software out of the box does not always offer a ready-made, best solution. Tailoring the system through custom development is sometimes necessary to give it the needed capabilities. “This is often true when working with a company’s proprietary programs and databases or when combining software programs from different vendors to create a ‘best of breed’ system,” said Wilson.

Ultimately, Ryder Scott furnished a software evaluation report citing the advantages/disadvantages of viable options, a recommendation based on the needs of Kufpec and an implementation plan. Ryder Scott recommended the Merak PEEP economic evaluation and decline analysis program, because Kufpec did not require integration with its proprietary systems and because the company needed built-in production-sharing agreement-modeling capabilities.

Ryder Scott headed off potential user “snags” or trouble spots in using the commercial software by preparing detailed user documentation in a compre-

hensive manual unavailable from the vendor. “The tradeoff with a highly automated program is that it is easy to calculate incorrect values accidentally,” said Wilson. “We identified potential issues and recommended specific processes to avoid implementation and usage problems for Kufpec.” Merak gave Ryder Scott permission to create and internally distribute the documentation to Kufpec because that specific type of support was not provided internationally.

The Ryder Scott-produced manual also documented the design of the reserves management process, charting workflow and timing of action items. In addition, the document specified the roles and responsibilities of various Kufpec personnel involved in the reserves process. For instance, it assigned individual tasks to positions – such as reserves coordinator, technical assistant, leadership team and reserves management committee – in creating, submitting and reviewing reserves during quarterly reporting cycles.

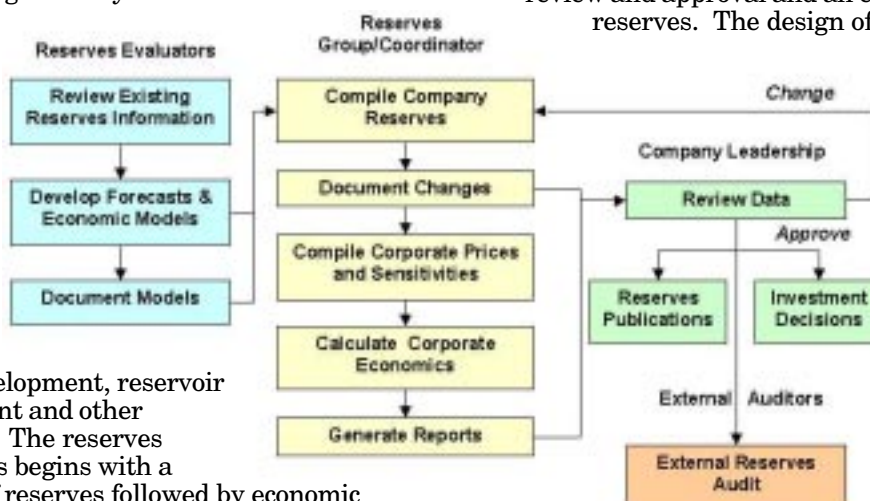
Standardization also included the Kufpec adoption of SPE/WPC (Society of Petroleum Engineers/World Petroleum Congress) petroleum reserves and resources definitions. Ryder Scott mentored Kufpec personnel in SPE/WPC reserves and resources categories by providing individual onsite consultation, seminars and training classes.

“Our professionals served on SPE committees that are directly or indirectly responsible for drafting and approving those definitions. Kufpec considered this qualification and others in commissioning Ryder Scott for the project,” said Wilson. The technology transfer program included training in reserves estimation methods and software and process implementation for the RMS.

Ryder Scott also performed an in-depth property evaluation for Kufpec simultaneously with the implementation of the RMS in a two-team approach. “Kufpec now captures reserves more efficiently and analyzes various economic scenarios using different pricing sensitivity cases,” said Wilson. Ryder Scott plans a process audit of the RMS sometime next year.

What is a reserves management system?

A reserves management system combines and integrates processes, software and personnel to enable a company to efficiently track changes in reserves and enable management to make decisions on its property portfolio, including acquisitions and divestitures, exploration and development, reservoir and field management and other upstream activities. The reserves management process begins with a technical analysis of reserves followed by economic



calculations, reserves classifying, proposal and documentation of reserves estimates, management review and approval and an external audit of reserves. The design of the process includes

charting workflow, timing events and integrating the process with proper software and databases.

RMS design is one of several management advisory services offered by Ryder Scott. For further information on advisory services, please go to www.ryderscott.com.

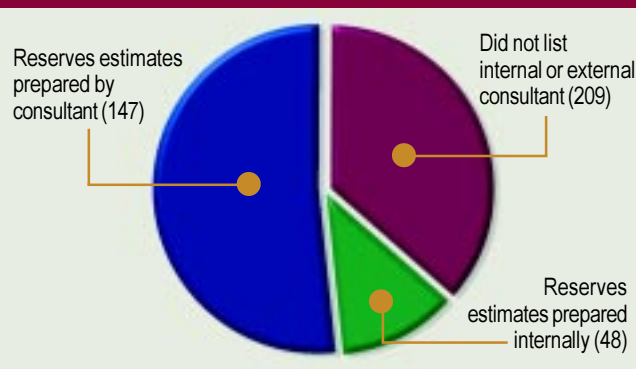
Use of consultants to estimate annual reserves unchanged despite M&A effect

Ryder Scott again most listed consultant in the John S. Herold survey of the latest annual reports

Despite industry consolidation, the practice of using independent consultants to estimate year-end petroleum reserves has not diminished, a recently published John S. Herold survey indicates. It shows that 3 out of 4 producers that identified reserves engineers in their 2000 annual reports cited independent engineering consultants vs. internal engineers. The 75 percent figure for consultant use is slightly lower than last year's 78 percentage, which is the highest since Ryder Scott has followed the survey beginning with the 1994 annual reports. John S. Herold Inc. is a Norwalk, CT-based independent research and consulting firm. (See sidebar on Page 7.)

This year's annual survey compiled year-end petroleum-reserves information from 404 publicly owned oil and gas companies listed on U.S. stock exchanges — fewer than last year's 498 companies, but a group of larger, combined companies. "Through various mergers and acquisitions, the industry consolidated in 1999-2000, which is reflected in the lower number of companies tracked," said Bill Jones, a vice president at Herold.

How 404 companies reported preparation of year-end reserves



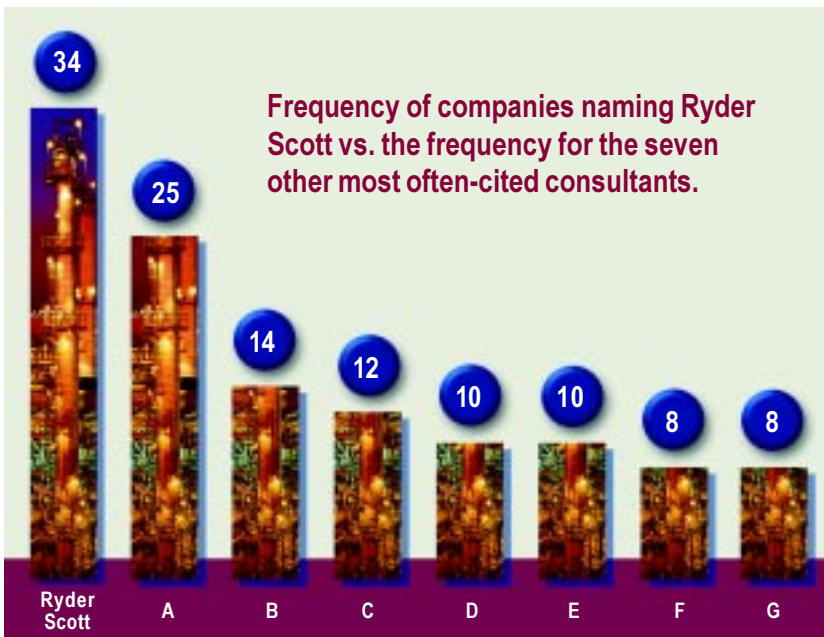
Even with the drop-off, the number of companies citing consultants remained relatively flat in 2000. Of 195 companies disclosing reserves preparation methods, 147 used engineering firms, down slightly from 153 and 152 in 1999 and 1998, respectively, and an increase from 140 using consultants in 1997. This year, 48 companies indicated internal preparation of year-end reports.

The surveyed companies from the United States and various other countries reported their reserves under U.S. Securities and Exchange Commission guidelines. Once again this year, Ryder Scott retained its top position as the most listed independent consultant of record for preparing year-end reports. Ryder Scott was listed in 34 annual reports, followed by 25 listings for the No. 2 consultant — a more than 4-to-3 edge over the closest competitor.

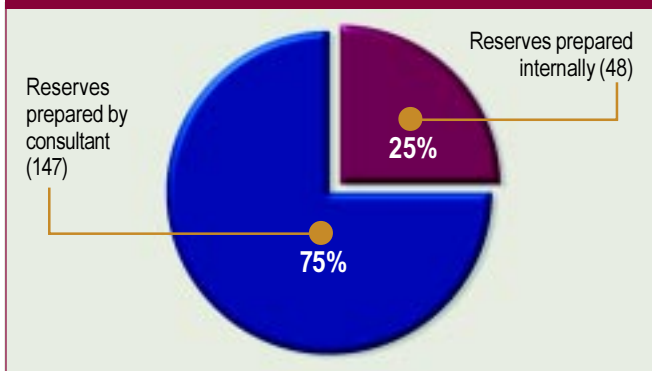
The 34 listings of Ryder Scott are an increase from last year's 31 listings despite industry consolidation that saw mergers of Ryder Scott clients PennzEnergy Co., Union Pacific Resources Group, Arch Petroleum Inc., HarCor Energy Inc., Hugoton Energy Inc. and Rutherford Moran Oil Corp. "Those companies dropped off the Herold survey, but we retained much of that business," said Ryder Scott CEO Ron Harrell.

The survey is mostly limited to companies in North America and to a few U.S.-registered overseas corporations issuing American Depositary Receipts. As such, it is not designed to measure the use of consultants in a worldwide market.

"During that period, four of our six biggest clients were companies outside North America and year-end reserves



How “disclosing” companies reported preparation of year-end reserves



certifications were not the main focus for three of those,” said Harrell. “These companies won’t show up on the survey.”

The Herold data shows that 209 companies (52 percent) did not release reserves-preparation information, a smaller percentage of non-disclosers than the 60 percent and 55 percent in 1999 and 1998, respectively. “A greater percentage of companies disclosing preparation methods in 2000 explains why there was less than a 4 percent drop in consultant listings amid a much larger 19 percent plunge in the number of companies tracked,” said Jones. The Herold survey shows a net loss of only six disclosers that listed consultants (147 in 2000 vs. 153 in 1999) from an overall group of significantly fewer companies (404 in 2000 vs. 498 in 1999).

Overall, the Herold survey indicated that year-end reserves work in North America is spread among 39 small and large U.S. and Canadian shops. The most-often-listed consultants have carved a lion’s share of the market. The eight most-listed consultants garnered 67 percent of the listings or 120 of the 178 citations by 147 companies.

Generally, the largest U.S.-registered oil and gas companies used internal engineering staffs for annual reporting. However, 22 of the 50 largest corporations, as ranked by total assets in the latest “OGJ200,” referred to outside consultants in their annual reports. (The OGJ200 is an *Oil & Gas Journal* list of the largest 200 publicly traded U.S. oil and gas producers.)

This is a four percent increase over last year and a 16 percent increase over 1998 when only 14 of the largest 50 companies cited independent reserves engineers. Although this two-year jump does not constitute a trend, inarguably the survey shows that commissioning third-party consultants to independently certify reserves is not a waning practice among the multi-billion-dollar, U.S.-registered upstream companies.

Ryder Scott was listed as the primary engineer doing year-end work for two of the three largest companies that cited consultants — No. 15 Apache Corp. with \$7.5 billion in assets and No. 16 Devon Energy Corp. with \$6.9 billion in total assets. Overall, Ryder Scott was cited by nine companies of the largest 50 — two more citations than the next closest consult-

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Reserves replacement costs focus of new Herold report

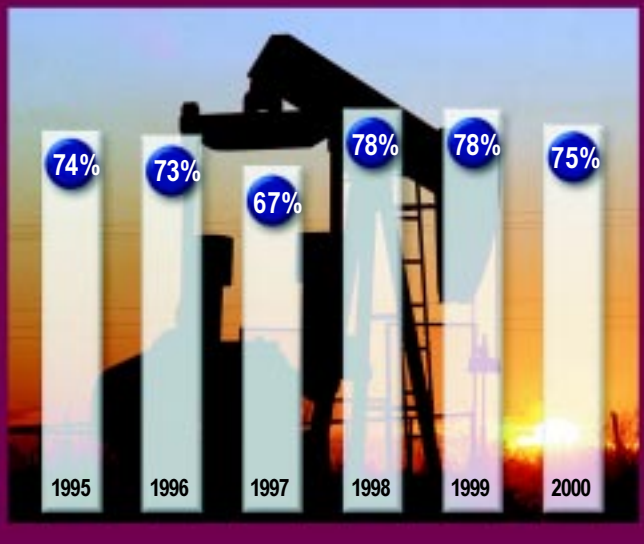
The tracking of company-by-company reserves preparation is just a small fraction of the industry research conducted by John S. Herold Inc. Founded in 1948, the research and consulting firm provides financial, operational, merger-and-acquisition and capital-markets data and analysis on the energy industry.

Herold recently published its 34th Annual Reserve Replacement Cost Analysis that tracks, organizes and charts reserves-replacement costs, finding-and-development costs and other key metrics by company, by peer group, by regions of the world and in other detailed breakdowns.

“Oil and gas companies use our analysis to establish benchmarks in different operating provinces and to compare peer-group performance to their own,” said Bill Jones, vice president of business development at Herold. “They also use it to set compensation goals and as background research in investor relations communications.”

Not only does the report track the relative performance of approximately 225 public oil and gas companies worldwide, but it identifies factors and trends affecting the industry’s overall performance and direction. Herold compiles the database information from basic data in financial statements and generates performance ratios. The analysis is available in hard-copy and electronic formats, including online. For further information, contact Jones at the Houston office at 713-651-1399 or at bjones@herold.com.

Percentage of companies that reported the use of consultants (vs. using internal engineers) to estimate year-end reserves*



Year-end statistics for 1995 through 1997 were compiled by independent accounting firm Arthur Andersen LP.

Editor’s Note: The survey is limited mostly to companies in North America and a few U.S.-registered overseas corporations. As such, the survey does not precisely measure year-end consultant use in a worldwide market.

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rial to the company,” said Wagner. “But for the smaller partner, the number is material and affects its stock price and ability to borrow.”

The larger company may have gone beyond current SEC regulations, but had compelling evidence and presented adequate data to meet the reasonable certainty test, he added. “Unfortunately, the smaller company wouldn’t be able to book the discovery unless the SEC considered all merits of the case,” said Wagner. “The SEC’s willingness to consider compelling evidence to include additional data for booking purposes shows great promise in leveling the playing field while still protecting the public.”

For further information, contact Harrell at ron_harrell@ryderscott.com, Gardner at tom_gardner@ryderscott.com or Wagner at bob_wagner@ryderscott.com.

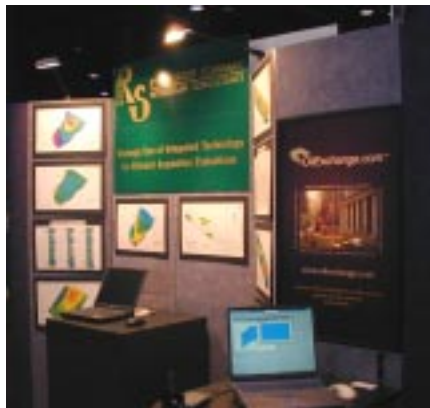
Herold—Cont. from Page 7

ant. “No doubt, we have large company clients. However, smaller companies make up a considerable portion of our client composition. We offer the same high level of personal service to both large and small clients,” said Harrell.

Since Ryder Scott has followed the survey for the past seven years, the firm has consistently led the rest of the field as measured by the following:

- The number of public companies publishing reserves estimates attributed to independent consultants.
- The size of the reporting companies using independent consultants.

As the best available marketplace barometer, the Herold survey indicates that Ryder Scott, by a decisive margin, is used more often than any other consulting firm in the world for preparing year-end reserve estimates in accordance with U.S. SEC guidelines.



Ryder Scott will have a booth at NAPE similar to this one at the PPX trade show last August. At NAPE, attendees will learn more about the company’s property evaluation services.

Ryder Scott to exhibit at NAPE



Ryder Scott invites you to join us at NAPE Expo 2002 at the George R. Brown Convention Center in Houston, Jan. 29-31. Professional staff will be on hand to demon-

strate some of our property evaluation capabilities at booth 314/316. At NAPE Expo, oil and gas companies will introduce their domestic and international petroleum properties to an estimated 8,000 attendees. Marketed properties include prospects, producing properties, U.S. onshore and offshore plays and international opportunities. Capital providers and consultants also exhibit. For further information, go to www.napeonline.com.

Erratum

In the September article on Don May’s return to Bradford, PA, the third employee of Ryder Scott should have been identified as Harold Engel. Likewise, the names of George Valsing and Roy Williams should have been spelled as they are here. The original submissions were misspelled and published that way.

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