

Monday, September 9, 2019

Norris Conference Centers • 816 Town and Country Blvd #210
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: \$40 Preregistered members; \$45 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.

Pre-registration without payment will not be accepted.

Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

HGS International Dinner Meeting

R. Brent Boyd

Senior Geophysical Advisor,
Project Advancement Team
Anadarko Petroleum Corp

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Anadarko Petroleum Exploration Lookback 2004-18: Lessons Learned for Conventional Exploration Risk and Uncertainty Predictions

From 2004 through 2018, Anadarko Petroleum drilled over 250 exploration wells around the world. That effort led to the discovery of over 15 Billion barrels of oil equivalent. This success was not due to chance, but a concerted effort by Anadarko to add long-term corporate value through Exploration. In 2004, Anadarko management created a Risk Consistency Team, a group of experienced geoscientists and engineers, to evaluate the risking and resource range of volumes before every exploration well was drilled. The Anadarko explorationists estimated a chance of geologic success and a range of success-case resource volumes for each pre-drill evaluation. After the well was drilled, the exploration team analyzed the success or failure of each well and whether the discovered resource volumes fell within the pre-drill range of uncertainty. At the end of each year, the Risk Consistency Team analyzed the results and presented the lessons learned from the exploration drilling program to the Anadarko exploration community.

Anadarko explorationists were very good at predicting the success rate for wells whose chance of success was in the 30-80% range. Anadarko had no successful exploration well with a chance of success under 20%, but the sample size was small. For wells estimated to fall between 20-29% chance of success, Anadarko was too conservative. Above 80%, the teams were too optimistic.

Significant lessons can be learned when viewing exploration results over a 15-year period at Anadarko. The biggest lesson is that exploration success must start with a healthy prospect portfolio. A healthy portfolio is deep, continually updated, regularly high-graded and keeps pace with drilling activity. Anadarko had a tremendous run of new field discoveries from 2009-13. After that time, exploration success dropped off. This lookback shows that the lower success rate can be tied to the lower number of prospects being evaluated by the exploration teams, thus leaving fewer quality options for a drilling inventory.

Another lesson is that successfully predicting risk and uncertainty in an exploration program depends on drilling a statistically significant number of wells. In the years when Anadarko was drilling over 10 exploration wells per year, the teams were very good at predicting chance of success and resource range of volumes. Conversely, the years when fewer wells were drilled are the years that exploration teams had the hardest time making predictions.

Finally, a tendency present throughout the 15-year lookback was that resource range predictions were skewed toward over-promising and under-delivering volumes. The Risk Consistency Team continued to address this concern by focusing on the small-volume (P99) end of the resource range and making sure those volumes were very small. Even so, this tendency was never fully overcome. ■

Biographical Sketch

R. BRENT BOYD has a 34-year career in oil and gas exploration. He graduated in 1985 with a B.S. in Geophysics from Texas A&M University. He started working for Arco Oil and Gas that year, spending time over the next few years in Plano and Midland exploring for hydrocarbons in the Permian Basin. In 1993, he was transferred to Vastar Resources in Houston, where he worked in the Mid-Continent exploration team. In 2000, Brent left for Anadarko Petroleum and has spent most of the remaining 19 years working African basins for oil and gas opportunities. In 2018, he was named to the Project Advancement Team, tasked with reviewing the geologic and economic risking and uncertainty assumptions for all Anadarko Exploration and Development drilling projects. Brent is currently in the middle of a three-year term on the HGS Board of Directors.

