

DEA continues to adapt to needs of oil industry

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With the decline of oil prices since 1985, most of the major oil companies have de-emphasized research and development, and some have exited the field altogether.

Some companies have set the goal of becoming "fast followers" of technological advances. They expect to obtain technology in the marketplace, or develop it through cooperative research ventures, often called joint industry projects or JIPs.



Organizations such as the Drilling Engineering Association (DEA) are one avenue through which such ventures are initiated. Information on the DEA is found at its website: <http://www.dea.main.com/>, where DEA is identified as "A Research - Operations Forum."

In more prosperous times in the oil industry, contractors brought many proposals to DEA, and DEA functioned mainly as a forum, or clearinghouse, for contractors to present research and development proposals to the operators.

By the late 1990's, DEA's leadership found this approach was not functioning well, and a few years ago the DEA almost died for lack of interest.

In fact, a similar organization in the US, the Production Engineering Association, was disbanded in the mid-1990's. (DEA's European counterpart, EPEA, continues to operate however - see <http://www.pea-jip.org/>)

In 1995, in cooperation with Energy Research Clearinghouse (ERCH), DEA surveyed the needs and interests of its member companies.

Instead of waiting for R&D proposals to come from the contractor community,

DEA has, over the past several years, sponsored and co-sponsored forums where technology needs and challenges were identified.

Those needs were communicated to the contractor community, and research proposals targeted to those needs came to the industry.

The following examples illustrate the types of forums and workshops sponsored by DEA:

- September 1997 - Deepwater Drilling Forum
- June 1998 - Shallow Water Flow Forum
- September 1999 - Flat Time Reduction Opportunities Forum
- April 2001 - Deepwater Geohazards Workshop
- May 2002 - Future of Well Construction Workshop
- Coming in June 2003 - Deepwater Drilling: Where are we headed?

By 2002, this effort had become increasingly difficult to sustain. The DEA had been a volunteer organization from the time it was founded, with most of the volunteer effort coming from operator R&D organizations. In the current business environment, that kind of volunteer effort is very scarce.

The Advisory Board of the DEA decided that the best solution was to form an alliance with a larger organization. This led to DEA becoming an affiliated organization of the IADC in late 2002.

The Advisory Board of the DEA and the Board of Directors of the IADC both view this as an affiliation with benefits for both organizations.

The DEA will have the advantage of the staff support provided by the IADC, and the IADC will gain the technical focal point provided by the activities of the DEA.

FORUMS AND WORKSHOPS

As an example of the way in which DEA operates, let's consider DEA's very first attempt at an industry-wide meeting. In September 1997, the DEA and ERCH

Deepwater workshop set for 17-18 June

Deepwater Drilling: Where are we Headed? is DEA's workshop set for 17-18 June in Galveston. The workshop will feature papers and presentations discussing the technical gaps remaining as the industry moves from ultra-deepwater exploration in water depths of 7,500 ft and greater to routine development drilling in those water depths. Presenters will examine the direction the industry should take to achieve solutions in that area.

Technology already developed for deepwater that can be applied to shallow water and onshore applications will also be discussed.

Among the topics to be discussed at the workshop are drilling rig design, well control, completions, shallow water hazards, HSE and training, and directional drilling.

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conducted an industry forum titled, *Deep Water Drilling - Identifying the Technical Challenges*.

This forum, rather than being a series of presentations to a passive audience, was a cooperative exercise in which the participants worked together to identify what technical challenges face the industry in drilling in deeper water.

The objectives of the forum were to:

- Describe the current level of technology;
- Determine the technical challenges presented by deep water drilling;
- Determine and prioritize problems (or if possible, root causes) of these challenges;
- Develop feasible proposals directed toward solutions of the top five described problems.

Sixty-eight participants representing oil and gas producers, oilfield service companies, research organizations, and regulatory agencies took part.

There were general sessions with presentations, but the deliverable product of the forum came from breakout sessions organized in functional areas: Well Design, Rig Issues, Well Control, Development & Production, and Deep Water Well Testing.

The most important technical challenges in each functional area were identified, and then the whole group met again to put the top technical challenges in priority order.

At the end of the process, the top five technical challenges for deep water drilling were identified.

Equally important, the DEA worked to find technical champions who would develop viable proposals to address these challenges.

TOP 5 TECHNICAL CHALLENGES

The top five technical challenges of Deep Water Drilling and the resulting DEA proposals to address these challenges are:

- Pre-drill pore pressure prediction
DEA - 119, Improved Methodology for Pre-Drill Pore Pressure and Fracture Gradient Prediction for Deep Water Wells from Knowledge Systems, Inc. (Phase II of this project is currently in progress)

- Shallow Water Flows
Shallow Water Flow Forum, June 1998; Also, Shallow Water Flow Diverter project initiated by Conoco, and Proposed DEA-128)

- Moorings
DEA-127 Advanced Anchor/Mooring System from XL Technology Limited

- Pore pressure prediction ahead of the bit
DI-80 Look Ahead - Pore Pressure Prediction Ahead of the Bit - Gas Research Institute

- Annular pressure prediction and monitoring
DEA-125 Annulus Pressure: Prediction, Monitoring, and Control for Deepwater Drilling from Tracor

ADVISORY BOARD

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In the years since the Deepwater Drilling Forum, DEA (with various co-sponsors) has supported forums and workshops about once a year.

From the DEA's point of view, the purpose of these meetings has remained the

same: to identify gaps in technology that present the opportunity for cooperative research ventures among the members of the DEA, or among other industry organizations.

USING INTERNET TECHNOLOGY

One of the recent successes of the DEA has been improved communication, achieved by use of the Internet.

DEA was one of the first oil industry organizations to make most of its business web-based.

Meeting agendas and minutes are posted on the DEA website, rather than being mailed. Meeting registration is by filling out a form on a web page.

The Drilling Engineering Association's membership list (Members must be oil and gas operators, Associate Membership is open to all interested parties.) and a list of current and recently completed projects is available on the website, at <http://www.dea.main.com>.

COOPERATION: KEY TO SUCCESS

In the current business environment, the exploration and production companies, and the service companies who support them, cannot afford duplication of effort.

Cooperative research ventures, coordi-

nated through organizations like the Drilling Engineering Association, are one way to improve cooperation among the companies.

An organization like the DEA cannot succeed by being passive and waiting for opportunities for cooperative development to appear.

There is a strong need to take action to identify needs and technical challenges in the industry, communicate them as widely as possible, and actively support the development of proposals for projects to develop technology

The Drilling Engineering Association will continue to strive for cooperation in the business environment of the E&P industry as it evolves.

No doubt the industry will continue to use the leverage that cooperative research ventures provide to obtain much of the technology the drilling industry will need in the future.

MISSION

The DEA was formed to advance the technology related to drilling wells by providing a forum for:

- Presenting proposals for industry drilling-related projects sponsored by members of the Association for the benefit of both members and non-members.

- * Exploring the different levels of interest from members in potential drilling related problems to aid in developing future industry sponsored projects.

- Acting as a liaison for DEA members with universities and other research groups.

STRUCTURE

- Members are operating companies

- Associate Members are typically service companies, research organizations or government agencies, but associate membership is open to anyone

MEMBERS

AGIP Petroleum
EnCana
BHP Billiton
BP
Burlington Resources
ChevronTexaco
ConocoPhillips
Devon Energy
TotalFinaElf
ExxonMobil
Japan National Oil Corp.
Kerr-McGee Corporation
Marathon Oil Company
Nexen Energy
OMV Aktiengesellschaft
OXY USA Inc.
PEMEX
Petro-Canada Resources
Shell Canada Limited
Shell Oil Company
The Williams Companies
Unocal Corporation

ASSOCIATE MEMBERS

ABB Vetco Gray Inc Advanced Geotechnology, Inc. Baker Hughes Big "6" Drilling Company C-FER Technologies CSIRO Petroleum CTES, L.C. Cudd Well Control Energy Research Clearing House Gas Technology Institute Halliburton Energy Services Knowledge Systems, Inc. Kelco Lockheed Martin Idaho Tech Co. Los Alamos National Laboratory Maurer Technology Inc. M/D Totco Minerals Management Service	Nadet Institute OGS Laboratory, Inc. Ocean Drilling Program Partex Industries, Inc. Petrospec Technologies Petroleum Technology Transfer Council Sandia National Laboratory Smith International, Inc. Stress Engineering Services, Inc. Technology International, Inc. Tempress Technologies, Inc. TerraTek TIW Corporation Warrior Technology Services Inc. Westport Technology Center International Weatherford World Oil
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- All meetings are open, and any project can be joined by any organization willing to sign the project agreement

- Association business is run by an Advisory Board and officers

- Officers must be from Member (not Associate Member) organizations

ACTIVITIES

- Quarterly meetings, with presentation of project proposals for Joint Industry Projects, and other technical and business-related discussion topics

- Updates of the progress of ongoing Joint Industry Projects

- Annual forums or workshops. ■

Completed DEA Projects

Description

Status

A Proposal to Develop an Improved Methodology for Pre-Drill Pore Pressure and Fracture Gradient Prediction for Deep Water Wells. Hydrodynamic Basin Studies for up to 10 selected mini-basins in the Gulf of Mexico deep water and geologically similar areas elsewhere in the world. Each basin study will result in the construction of a digital 3D basin geopressure model for that basin that can be used to quickly and accurately estimate geopressures at any point in the basin. Study is ongoing.

Updated 12/6/2002

"STABView" - A Borehole Stability, Lost Circulation, and Sand Production Risk Analysis Software

Completed 6/30/02

JIP to Develop Hollow Sphere Dual-Gradient Drilling System

Completed

Advanced Wellbore Stability Model (Wellstab-Plus)

Completed

Deepwater Riser Wear Technology

Completed 10/1/2002

Shallow Water Flow Database

Complete

Use of Converted Shear Wave Data to Identify Shallow Water Hazards Prior To Drilling

Completed 1/01

Modernization of Tubular Collapse Performance Properties

October 2002

Underbalanced Completions Manual (UBC)

Completed - 02/00

A Proposal to Develop an Improved Methodology for Pre-Drill Pore Pressure and Fracture Gradient Prediction for Deep Water Wells

Completed 04/01

Drilling Gumbo Shale - A Study of Environmentally Acceptable Muds to eliminate shale hydration and related borehole problems

Completed 08/01