Learning lessons, looking forward: BP and the future of the deep water

Speaker: **Lamar McKay**
Title: **chief executive, BP gulf coast restoration organization**
Speech date: **3 May 2011**
Venue: **Offshore Technology Conference - Houston, Texas**

Thank you very much for that generous introduction.

I am pleased to be with you this morning at the Offshore Technology Conference, the leading forum for discussing offshore oil and gas exploration.

The last year has been an extremely challenging and painful one for our company, and for the entire energy industry.

Less than two weeks ago, we marked one year since the Deepwater Horizon accident, killing 11 men and resulting in the worst oil spill in US history. We regret the loss of life and the impact on the communities and environment of the Gulf Coast states.

Thousands of BP people and their families call the Gulf Coast states home, and BP and its heritage companies have been part of the community in those states for decades. This accident and its consequences are very personal to all of us.

In the wake of Deepwater Horizon, many questions were raised about the nature of deepwater oil and gas activities. Why is deepwater drilling important to meeting global energy demand? How does industry continue with deepwater drilling in a manner that is safe for both the people involved as well as the environment?

These are serious questions, and they deserve serious answers.

So this morning, I want to discuss three things.

First, I will discuss the outlook for global energy demand, and the role of deepwater exploration and production in satisfying that demand;

Second, the critical part that technology plays in enabling exploration at ever greater depths and pressures;

And finally, the lessons we are drawing from our recent experiences to enhance the connectivity between technology and safety.

Global energy outlook and the role of deepwater exploration

If there is one word that characterizes world energy markets over the last few years, it is “volatility.”

That is a big change. From the early 1980s to 2003, prices were reasonably low and stable. You remember those days. You could fill the tank of a mid-sized American sedan and get change back from a $20 bill.

That began changing in the fall of 2003, when oil moved above $30 a barrel. Prices rose steadily through the middle of the decade, breaking through the $100 per barrel barrier in early 2008, before reaching $145 a barrel in mid-2008.

But it is reasonable to say that the volatility that has characterized the energy markets is going to be with us for some time to come.

There are many reasons for that, but mostly, it comes down to simple supply and demand - with the latter growing more steeply and steadily than the former.

In an effort to see if we could get a handle on this new world of energy price volatility, BP recently undertook its first-ever projection of world energy trends. The result, Energy Outlook 2030, was published in January

The numbers are stark.

Total world energy demand is likely to increase some 40 percent by 2030. Given the lead times in our industry, that's just around the corner. It is the equivalent of adding the entire energy demand of today's United States roughly twice over in just 20 years.

The bulk of that new demand will come from the developing world. As recently as 1992, China was a net oil exporter. Last year, she imported over five million barrels of oil per day. In 2000, the US used 150 percent more energy than China. Today, China uses more than the US.

Energy Outlook 2030 projects that energy sources will diversify and that non-fossil fuels together will likely account for a significant source of growth for the first time ever. Between 2010 and 2030 the contribution to energy growth of renewables is projected to increase from 5 percent to 18 percent. Biofuels are expected to account for around 10 percent of global transport fuels.

What about fossil fuels? Their contribution to primary energy growth is projected to fall from 83 percent to 64 percent, with coal and oil losing market share as natural gas ramps up. But even as the share of new energy demand being met by oil falls, the absolute level of demand will continue rising, from around 85 million barrels per day to over 102 million by 2030.

Where will that production come from? Many of the world's existing fields are reaching maturity, and there are options for increasing their recovery. And new technology is also opening up new options. One of these is the Arctic, which is only just now starting to be explored. And another is the deepwater, which BP estimates may hold as much as one-fifth of all of the oil and gas yet to be discovered on Earth.

Indeed, we have been seeing the trend toward the deepwater accelerate for some time.

Globally, a majority of new oil and gas reserves discovered have been offshore, with an increasing percentage of those reserves coming from the deepwater. The US is no exception to this rule.

In the year 2000, deepwater production in the US surpassed shallow water production and by 2008 more oil had been discovered in the deepwater than the shallow water and onshore combined.

This progress has been driven by engineering and technology – including some new floating rigs that are larger than most World War II battleships.

From zero two decades ago, there are now 137 deepwater rigs in operation and a further 69 - 50 percent increase in capacity planned, on order or under construction.

By 2009, the industry had drilled some 4000 wells in over 1000 feet of water in the Gulf of Mexico alone.

So the deepwater is indispensable to the world's energy future. Indeed, we estimate that the percentage of world oil production coming from the deepwater will rise to around 10 percent by 2020.

Reaching that percentage, however, will require unprecedented investment in new technologies.

These technologies need to operate safely and reliably under enormous pressures and temperatures

- At ever greater water depths;
- In pre-salt environments;
- And with ever more challenging combinations of fluids and rocks.

BP is a global leader in this space, a position we intend to continue building upon.

So this morning, I'd like to give you some sense of the role technology is playing in BP as we look to do our part in meeting this burgeoning demand for energy.

Technology: innovation that delivers

The overarching aim of technology at BP hasn't changed: it underpins our entire business.

But first and foremost, it supports safe, reliable and compliant operations.

Ultimately, we look to technology to produce four key deliverables:

- Improved safety and operational risk management;
- Increased recovery, which will grow reserves;
- Increased production;
- And competitive access to new resources.

The latter is exceptionally important. In a world where access to resources is substantially controlled by national oil companies, BP's competitive edge lies in our ability to perform challenging technical tasks, such as working in the deepwater, the Arctic, and high-pressure/high-temperature environments.

These capabilities as well as the talent to use them form an integral part of our conversations with resource-holders worldwide. Technology is thus not an "add-on" at BP, or something that is nice to have. It is central to what we do and actively informs our business strategy.

For an example of what technology can achieve, look no further than the nearby Gulf of Mexico.

Back in the 1990s, there was a widespread sense in our industry that the Gulf of Mexico was played out.

One of the major obstacles to exploring in the Gulf was that many of the reservoir targets are overlaid by massive salt canopies that tend to distort conventional seismic signals.

Seeing through this salt is crucial. BP has made much progress developing new technology, such as wide-azimuth towed array streamers, dubbed WATS.

WATS uses a standard 3D seismic survey configuration of receivers mounted on towed streamers to collect data, but rather than using a single sound source mounted on the recording boat, additional source boats are deployed. This makes it possible to collect images from different angles - the wide azimuth. By combining and processing the data, a much clearer picture of the geology below the salt emerges.

For their work on WATS, two BP scientists, Carl Regone and John Etgen, received the prestigious Virgil Kauffman Gold Medal from the Society of Exploration Geophysicists.

That marriage of technology and talent is a major reason the Gulf of Mexico is now one of the world's premier energy basins. A study by PFC Energy estimates that, by 2020, over 50 percent of Gulf of Mexico production will come from the ultra-deep water.

And it won't stop there. Advanced seismic imaging has global applicability.

So it shouldn't be surprising that advanced seismic acquisition is one of technology areas we at BP call our "flagships." Each of these has the potential to convert more than a billion barrels of hydrocarbon resource into the energy reserves that the global economy demands.

I'll mention just a few here.

Inherently Reliable Facilities, of course, aims at increasing operational integrity and reliability. Under this flagship we are using ultrasonic sensors for enhanced integrity inspection, as well as digital radiography to obtain additional data on subsea infrastructure.

Field of the Future is our project aimed at providing real-time data capabilities that enable better-informed operational decisions. But this digital data can also be used to anticipate and act on potential operational risks before they become problems.

The Beyond Sand Control flagship has been developing enhanced diagnostic tools to aid completion reliability during the installation of sand control downhole equipment.

Pushing Reservoir Limits is about increasing the amount of oil that can be recovered from producing or discovered fields. But if you increase the recovery rate from existing wells, it stands to reason that you will reduce the need to undertake the additional drilling and operation of more wells.

Clearly, investing in the right technologies and the right people is innovation that delivers.

Our industry's reliance on technology, of course, often becomes most apparent when something goes wrong. So when something does go wrong, it imperative that we find out why and work to prevent anything like it from happening again. That is why we are studying and applying lessons of Deepwater Horizon.

Lessons learned

BP is determined to enhance deepwater safety and response capabilities. We intend to work on this together with our industry colleagues and our regulators.

The Deepwater Horizon response was an event of unprecedented scale and complexity, testing the very limits of industry's knowledge, technology and available resources.

The lessons we learned came from the accident itself, the response and our own internal investigations. We are also working with government agencies, scientists, the industry and other investigative bodies to identify and implement relevant operational and regulatory changes that will enhance safety practices throughout the industry.

Before going on, I would like to emphasize that last year's efforts were by no means BP's alone. I want to offer our thanks to all the companies here in Houston and elsewhere that offered their help and support to us.

To best convert the many learnings into focused sustainable enhancements, we organized them into five areas:

- First, prevention and drilling safety. The ability to maintain control of the well from spud to abandonment is our first and foremost priority.

However, we need to be ready if, for any reason, well control is lost. As a result, we are continuing to build out capabilities in four other areas:

- Containment is the ability to minimize and stop the flow of hydrocarbons from the well by capturing the flow at the source.
- Relief wells offer the ability to intersect and kill the well from the bottom if we are unable to do so from the top.
- Spill response focuses on the ability to manage the released hydrocarbons in order to minimize their impact on the environment.
- Crisis management summarizes the ability to co-ordinate the overall response and facilitate effective decision making through the systematic organization of people, information and technology.

So what did we learn and where are we headed within BP?

Prevention and drilling safety

Within the category of prevention and drilling safety, three of the focus areas where learnings are being embedded include:

- First, enhancing our engineering technical practices;
- Second, BOP management. We are using additional, independent third-parties to verify BOPs will activate in an emergency. Related to this, we are testing ROVs subsea to confirm that they can activate the BOPs.
- The third area is enhancing cementing services oversight.

Containment

There are three important containment capabilities we employed during the response. In all three – capping, collection, and simultaneous operations -- we are advancing the state of knowledge, embedding it in our organization and working with industry on sustainable solutions.

Access to capping equipment is important. And, if capping doesn't work as quickly as is needed, the oil will have to be collected.

To enhance capabilities for our own operations:

- BP mobilized two top hats to the UK North Sea, and we are participating with the Oil Spill Prevention and Response Advisory Group (OSPRAG) on the design and construction of a next-generation capping stack there.
- Almost all of the containment equipment used and developed during the Macondo response, whether or not it was deployed, has been made available to the Marine Well Containment Company of which BP is a permanent member.
- To enhance collection capability, we also are working to increase access to free-standing riser systems – meant for deepwater applications and effective in challenging subsea conditions -- not only in the Gulf of Mexico, but in deepwater basins across the world.
- BP also is developing its own capping equipment that can be flown to the various basins where we operate.

Finally, we are seeking to systemize what we learned in large scale simultaneous operations (SimOps). The capability to execute and monitor complex surface and subsea activity in a four-dimensional system around the source control area is being extended into our day-to day operations.

Relief wells

The relief wells that were planned and drilled in response to the Deepwater Horizon accident followed a textbook approach. We began our planning the day after the accident. And the first relief well was spud – remember it was a deepwater well – within 12 days and successfully intersected the well on the first attempt. In the end, the relief well only confirmed that the well had been successfully killed.

Our plans will incorporate rigs and equipment required for drilling of relief wells if necessary for projects across the world.

We also are working to enhance and codify real-time ranging technology. This technology is incredibly useful and helped cut down on the time needed for logging from about two days for conventional ranging to about six hours for real-time ranging.

Spill response

Our spill response was focused in three arenas: our open water response closest to the well site and source of the spill, our near shore response, and our onshore response.

In the open water response we focused on how to control the spill as close to the source as possible.

- Use of subsea dispersant was particularly important to help mitigate environmental impacts.
- We also used in situ burning on a much larger scale than was ever done before, developing new techniques that allowed us to complete around 400 burns, safely deploying multiple burn teams at one time.

For near shore response,

- The traditional tool is skimming, or scooping up the oil. We used “enhanced booming and skimming” to expand the range and effectiveness of recovery in open water and also near shore. We are encouraging oil spill response organizations around the world to adopt enhanced booming and skimming to improve recovery efficiencies on the water’s surface.
- Also important to near shore and open water response, we are codifying procedures and capabilities that helped us direct the skimming fleet through use of advanced surveillance resources, including satellite imaging and aircraft.

Our onshore response included the development of beach cleaning technology innovations that improved cleaning efficiency.

Even in the most demanding moments of the response, the people involved were constantly coming up with new ideas and ways of improving our response across the board.

BP is continuing to test new technology and working with industry groups on response planning and developing enhanced standards and capabilities.

Also, within BP, we are developing internal guidance to facilitate access to enhanced systems for the global basins in which we operate.

Crisis management

Crisis management is closely tied to spill response, but it's broader.

BP worked closely with the US Coast Guard (USCG) and other federal, state and local government agencies.

A strong foundation was built under the federal Incident Command System structure to establish a centralized Unified Command Structure that was replicated and cascaded through local organizations. Ultimately, 19 local branches were established across five states.

We adapted from other industries an ability to view the response in ways that enabled faster, informed decisions. The Common Operating Picture (COP), as we called it, created an integrated view, providing a timely interactive visual of the response.

Using that Common Operating Picture, we were able to update our Incident Action Plan every 12 – 24 hours, providing updated information to aid in decision making.

I hope this overview of the five capability areas is helpful. BP looks forward to working with our industry colleagues on these and other areas where we can apply best practices.

In addition to the improvements in equipment and procedures I described, BP has taken other significant steps designed to strengthen safety and risk management globally.

Our corporate structure has changed significantly. A new Safety and Operational Risk Organization has been formed to help drive safe, reliable, and compliant operations, including intervention rights, throughout BP.

Another major organization shift is in BP's upstream business, now divided into three divisions – Exploration, Development and Production. This restructure is designed to enhance the way we operate with focus on how we manage risk, deliver common standards and processes and build human and technical capability.

Changes also have been made in senior leadership. BP has strengthened its Board of Directors, adding retired US Navy Admiral Frank "Skip" Bowman, whose history with the U.S. Navy underpins his focus on safety.

Also, to help put safety and risk management at the heart of the company, BP is restructuring how we reward performance.

Conclusion

The Deepwater Horizon accident highlights the challenges we as an industry confront as we work on new technical and physical frontiers in the quest to develop the energy of the future.

Overcoming those challenges in an environment like the deepwater is a remarkable story of what is possible with the marriage of technology and talent. It underscores the fact that providing the world's energy needs requires brains just as much as it does brawn.

While we have lessons to learn, we must also face resolutely forward.

If we all work together, I have no doubt that the talent assembled at this conference can help power an industry that provides the world's people with the energy they need to create jobs and raise living standards. And that they can do it safely and reliably.

Thank you for your time and attention.

Within a few months, however, prices crashed as financial crisis and recession gripped the world economy. Prices dropped all the way back to nearly $30 a barrel. Today, it's looking a lot like 2008 again, with oil back above $100 a barrel and gasoline prices around $4 a gallon in most of the country.

Now if you are expecting me to predict the future price of oil, J.P. Morgan said it best when asked what the stock market would do, "It will fluctuate" he said.