

Statement of
David Lawrence
Executive Vice President, Exploration and Commercial
Shell
to the
Subcommittee on Energy and Mineral Resources
of the
Natural Resources Committee
Thursday, June 2, 2011

Introduction

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to testify today. I would like to thank you for having this hearing to examine the resource potential in the Alaska Outer Continental Shelf (OCS) and why this is important to the future of the Trans Alaska Pipeline System (TAPS) and the Nation's energy supply.

As Executive Vice President of Shell Exploration and Commercial, I lead a team of professionals who identify, invest in and explore for oil and gas resources around the world. The Arctic, including Alaska's offshore, holds world-class resource volumes. That is why Shell has invested in leases off the coast of Alaska.

Alaska can continue to play a major role in meeting the energy needs of American consumers and American businesses, but achieving that result requires action and political will. Developing these resources will extend the life of TAPS, and also create thousands of jobs; hundreds of billions in revenue for local, state and federal coffers; reduce imports; and improve the balance of trade.

Shell has been prepared to explore in Alaska's OCS since 2007, but regulatory and legal challenges have prevented us from drilling even a single well. In the five years since first seeking to explore in Alaska, Shell has drilled more than 400 exploration wells around the world. I remain hopeful that the barriers to exploring in Alaska's OCS will be addressed so that Shell can begin its exploration drilling in 2012.

Today I will discuss:

- Global energy demand forecasts, and the fact that oil and gas will play a critical role in meeting future energy needs and in fueling the economy.
- Alaska's OCS resource potential, and the benefits to the nation of developing those resources.
- Shell's proposed exploration program in Alaska and the challenges that have blocked the program.
- And finally, some recommendations for moving forward.

Global Energy Demand

The world must grapple with the reality that global energy demand is projected to increase by roughly 50 percent over the next 20 years and could double by 2050. As the global recession fades and economies recover, demand will accelerate. A key driver will be strong economic growth and a vast, emerging middle-class in the developing nations.

To address this demand, we will need all sources of energy - hydrocarbons, alternatives, renewables and significant progress in efficiency. Oil and gas will be the dominant energy source for decades.

Renewables and energy efficiency will play an ever-increasing role. Shell is actively pursuing research and development into next generation biofuels. We also have a wind business in North America and Europe, for which I am responsible.

Future growth for alternative energy forms will be paced by the speed of technological development, public and private investment capacity, government policies, and the affordability of energy supply. Still, it takes several decades to replace even one percent of conventional energy with a renewable source. The effort to tip the scale towards more renewable sources of energy is worthwhile but even unprecedented growth in renewables would leave an enormous energy gap that must be filled with oil and gas.

As we move to meet the world's energy needs, environmental challenges must be met and policies kept in place to ensure responsible energy development. We must recognize and provide the amount of energy that will be required to allow our economy to grow; and do so in an environmentally sustainable way.

Governments have a role to play in defining the policies that will foster a viable, efficient and workable marketplace that allows technology and innovation to move forward. Industry – and most particularly the energy industry – has an important role to play as well.

U.S. Oil and Gas Resource Potential

The President recently acknowledged that reducing dependence on imports was a national policy imperative. We agree. The U.S. is resource-rich in many ways, especially in oil and gas. Yet, the U.S. imports more than 60 percent of its petroleum.

Consider the enormous costs created by importing oil. According to the EIA:

- Petroleum net imports will average 9.7 million barrels per day 2011 and 10 million barrels per day in 2012, comprising 50 percent and 52 percent of total consumption, respectively.
- Imports cost the U.S. more than \$350 billion last year.

I applaud the President for highlighting the need to reduce imports. Producing more oil and gas in our own country is a “win-win” proposition. It provides real economic and security benefits. With increased domestic production, less money is exported from the U.S., more money is invested here and federal revenues increase through royalties and taxes. This can be done in a way that provides appropriate environmental protections based on solid science and an understanding of ecosystems and the impact of oil and gas activities on them.

I offer an example from the OCS:

According to the U.S. government, 420 trillion cubic feet of natural gas and more than 86 billion barrels of oil are yet to be discovered on the OCS, including Alaska. To put that into perspective, that is enough natural gas to heat 100 million homes for 60 years and enough oil to fuel 85 million cars for 35 years.

The greatest offshore resource potential lies in four key areas: the Gulf of Mexico, Alaska and the Atlantic and Pacific Coasts.

- **Gulf of Mexico** - This has been the heartland of U.S. offshore activity. The industry has been in the Gulf for more than 60 years, producing more than 10 billion barrels of oil and more than 73 trillion

cubic feet of natural gas. Estimates state there are at least 45 billion barrels of oil and more than 233 trillion cubic feet of gas remaining.

- **Alaska OCS - World Class Potential** - The Alaska offshore likely holds some of the most prolific, undeveloped conventional hydrocarbon basins in the world. Conservative estimates from the Bureau of Ocean and Energy Management Regulation and Enforcement (BOEMRE) place roughly 27 billion barrels of oil and over 120 trillion cubic feet of gas in the Alaska OCS.
- **Atlantic and Pacific Coasts** – Assessments of these areas have not been updated in decades, but the estimate is that the Atlantic Coast holds 4 billion barrels of oil and 37 trillion cubic feet of gas and the Pacific Coast holds 10 billion barrels of oil and 18 trillion cubic feet of gas.

History of Alaska OCS

The world has long been aware of the Arctic's vast resources. In total, more than 500 exploratory, production, and disposal wells have been drilled in the Arctic waters of Alaska, Canada, Norway and Russia. As a result of federal OCS lease sales in the 1980s and 1990s, more than 35 wells have been safely drilled in the U.S. Beaufort and Chukchi Seas.

Shell is proud of its offshore legacy in Alaska, having produced in the state waters of Cook Inlet in Alaska for more than 30 years beginning in 1964. In the late 1970s and mid 1980s, Shell drilled exploration wells offshore in the Gulf of Alaska, St. George Basin and the Bering Sea. In the late 1980s and early 1990s, Shell drilled several exploration wells in the Beaufort Sea and later drilled four of the five exploration wells ever drilled in the Chukchi Sea.

Although oil and gas were found, Shell chose not to proceed to development. We plugged and abandoned those exploratory wells for economic reasons – including the fact that, at that time, TAPS was already running near capacity.

Since 2005, the federal government has held several more OCS lease sales in Alaska. Shell participated in these lease sales and in fact, is now the majority leaseholder in the Alaska offshore. Shell has paid the federal treasury nearly \$2.2 billion for ten-year leases in the Beaufort and Chukchi Seas. Additionally, Shell has invested more than \$1.5 billion and six years preparing for an exploration drilling program with unparalleled mitigation and safety measures. Shell's work includes multiple years of 3D seismic data collection, first-of-its-kind baseline science, shallow hazard surveys, geotechnical programs, numerous social investment initiatives and hundreds of meetings with North Slope residents.

The Benefits of Developing the Alaska Offshore

The benefits of developing Alaska's offshore oil and gas resources are many - not only to Alaska, but also to the Lower 48. Development would be an economic engine for decades to come.

The jobs growth and economic benefits of Alaska OCS exploration and development are well understood. A study conducted in 2010 by Northern Economics and the Institute for Social and Economic Research (ISER) at the University of Alaska details the potential national benefits of developing the oil and gas resources of the Alaska OCS:

- An annual average of 54,700 new jobs would be created and sustained through the year 2057, with 68,600 jobs created throughout decades of production and 91,500 at peak employment;

- A total of \$145 billion in new payroll would be paid to employees through the year 2057, including \$63 billion to employees in Alaska and \$82 billion to employees in the rest of the U.S.; and
- A total of \$193 billion in government revenue would be generated through the year 2057, with \$167 billion to the federal government, \$15 billion to the state of Alaska, \$4 billion to local Alaska governments, and \$6.5 billion to other state governments.

Several important implications for national policy and domestic supply are raised in the study including:

- Alaska OCS development maximizes the value of Alaska's and the nation's oil and gas resources by enhancing both value and volume. Using TAPS' existing infrastructure, which is currently operating far below capacity, would enhance value by lowering transportation costs. Further, the new expanded infrastructure needed to connect to TAPS would enable development of satellite fields such as the National Petroleum Reserve-Alaska (NPRa).
- Alaska OCS development would extend the operating life of TAPS and increase the viability of an Alaska gas pipeline, due to greater certainty of the available gas resource base to fill it.

To elaborate, Alaska's OCS likely has at least one-third more oil than has been produced in Prudhoe Bay, moved through TAPS and used to fuel the U.S. for the past 30 years. It is two-and-a-half times what has been produced in the Gulf of Mexico since 1990.

An independent assessment of industry-wide development of Alaska's Beaufort and Chukchi Sea OCS concluded that an average of about 700,000 barrels of oil per day would be produced for 40 years. This is equivalent to our 2010 oil imports from Iraq (506,000 bbl/day) and Russia (137,000 bbl/day) combined. This same study found that Alaska OCS production would peak at 1.45 million barrels of oil per day in 2030 (and 2.1 billion cubic feet of gas per day in 2050). This is more than our 2010 oil imports from some of our major importing nations, e.g., Mexico (1.03 million bbl/day), Saudi Arabia (958,000 bbl/day), Nigeria (996,000 bbl/day), or Venezuela (827,000 bbl/day).

Such production numbers, which could potentially eliminate the need for imports from one of our largest foreign suppliers, is significant, and even – more so in a world of increasing geopolitical instability.

Domestic energy production is critical for the security and prosperity of the U.S. Money spent on domestic energy cycles in the U.S. economy, increases domestic economic activity and jobs. Alaska OCS activity will also help address our national debt, bringing in hundreds of billions in federal revenues in taxes and royalties from oil and gas production and the economic activity that is stimulated as a result.

A major benefit from Beaufort and Chukchi development would be the long-term viability of TAPS. Since 1977, Alaska has supplied the U.S. and its refineries with vast quantities of domestic oil via TAPS, totaling roughly 17 billion barrels through 2010. The construction and operation of the pipeline has also provided hundreds of thousands of high paying jobs in Alaska and the nation, helping to lift America out of one of its worst economic downturns. A generation of Americans worked to build TAPS; and it remains not only an economic engine, but a symbol of American know-how and ingenuity. Unfortunately, without a reliable new resource base, TAPS' future is uncertain.

Production in Prudhoe Bay has fallen significantly in recent decades. At its height, TAPS supplied the nation with 2.1 million barrels of oil per day or about one-third of the nation's oil production.

Today TAPS supplies only 600,000 barrels per day; about 11 percent of our domestic supply. If the throughput in the pipeline continues to decline and no new supplies are developed, TAPS will eventually be shut down, cutting access to one of the largest sources of domestically produced oil in the country.

Our already increasing dependence on imported oil will accelerate and the U.S. balance of payments and federal revenues will both get worse.

A temporary shutdown of TAPS earlier in 2011 had an immediate impact on crude prices, jeopardized the continuity of the U.S. West Coast refinery infrastructure, and resulted in a spike in U.S. reliance on Russian crude supplies. This could be a harbinger of things to come unless we develop new resources in Alaska.

Fortunately, the U.S. has an opportunity to prevent this scenario from reoccurring. According to Northern Economics and ISER at the University of Alaska, if OCS oil is transported through TAPS, the higher volume of throughput would reduce the TAPS tariff and would extend the life of TAPS for decades. Doing so would require new pipelines that connect offshore fields in Camden Bay and the Chukchi Sea to TAPS. These projects would certainly rank among the largest private sector construction projects in U.S. history.

It is clear that resource development, such as OCS oil and gas production, is the first step in wealth creation. It has an enormous economic multiplier effect. Jobs and revenues created by oil and gas development reverberate throughout our economy, producing long-term high paying jobs. It creates a need for domestic manufacturing capabilities, steel production, transportation, infrastructure development, electronics and high-tech components. Alaska OCS development is a genuine long-term economic stimulus plan.

Finally, by exploring and developing our Alaska OCS resources, the U.S. has an opportunity to reaffirm its global role as an Arctic nation. It is no secret that the Arctic is becoming a critical location from a geopolitical and strategic perspective. Arctic nations are increasingly interested in international boundaries and opportunities for resources and economic development.

Recently, Norway and Russia signed a maritime border delimitation agreement that settled a long-standing seaward boundary dispute in the Barents Sea. The stimulus for the agreement was mutual cooperation that would allow the development of offshore Arctic oil and gas resources. Elsewhere, Arctic nations are asserting their claims to continental shelf borders in accordance with the United Nations Convention on the Law of the Sea. For instance, we've recently seen reports that Denmark will lay claim to the North Pole itself, as an extension of Greenland territorial waters. Even nations outside the Arctic are positioning themselves for Arctic resource development.

With continuing U.S. inactivity, our country risks falling even further behind the rest of the world in developing its Arctic resources. In Norway, Russia, Greenland and Canada, Arctic resources are highly valued and new exploration is already underway. We have an opportunity to develop our own Arctic resources and the infrastructure appropriate to facilitate our presence in this valuable region.

Offshore Safety Standards

Before moving to a discussion of Shell's Alaska OCS exploration program, it remains appropriate to acknowledge the *Deepwater Horizon* incident in the Gulf of Mexico. The incident forced a re-examination of offshore operations and led to new regulatory requirements that have raised the bar on safety and led to substantial changes in the way the industry operates. There is no question that the industry must be held to the highest standards both for protecting the environment and protecting the health and well-being of our workers and communities in which we operate.

Let me highlight a few of the new regulatory requirements systems adopted by the federal government and industry:

- The Interim Final Drilling Safety Rule is focused on minimizing the likelihood of an incident and addresses barriers that should be in place to prevent a hazard. Preventing an incident is a top priority.
- Responding to an incident is now substantially enhanced with new requirements for containment capability. The Marine Well Containment Company (MWCC), which Shell initially formed in partnership with three other oil and gas companies, is designed to do just that. The MWCC is a stand-alone organization committed to improving capability for containing a potential underwater well control incident in the Gulf of Mexico.
- The industry announced that a new Center for Offshore Safety will be created to promote the safety of offshore operations and enhance the government's regulatory role. The Center will provide an effective means for sharing best practices. Members will be subject to independent, third-party auditing and verification to ensure integrity. The Center will operate around an existing safety framework known as RP75, or "Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities."
- Industry has also significantly increased its resources to respond to a major oil spill by adding vessels, equipment and personnel. Significant research and development is ongoing for oil spills in ice.
- Shell recently announced it has taken the lead as operator of the Subsea Well Response Project (SWRP) to be based in Stavanger, Norway. Nine major oil and gas companies will work pro-actively and collaboratively progressing development of subsea well intervention and oil spill response equipment that can be deployed swiftly to different regions in the world.

In addition to regulatory requirements, a company must foster and promote safety relentlessly each day. At Shell we call this Goal Zero. Everyone who works for us – both employee and contractor – is expected to comply with the rules; intervene when anything looks unsafe; and respect people, the environment and our neighbors. Compliance is not optional.

We have personal safety systems and procedures with clear, firm rules; simple “do’s and don’ts” covering activities with the highest potential safety risk, such as getting proper authorization before disabling safety-critical equipment and protecting against falls when working at heights.

We have process safety systems to ensure the safety and integrity of our operations and assets. Process safety is also managed through a variety of tools, such as well and facility design standards; established “operating envelopes” not to be exceeded; maintenance and inspection intervals for safety critical equipment; and an effective Management of Change process.

Our approach also requires that all our drilling contractors develop a Safety Case to demonstrate major risks are properly managed. A Safety Case shows how we identify and assess the hazards on the rig; how we establish barriers to prevent and control the hazards; and how we assign the critical activities needed to maintain the integrity of these barriers. Further, it guides the rig and crews in risk management; and ensures staff competency, especially for those new to the rig.

Shell’s Alaska Exploration Program

Shell is planning an offshore oil and gas exploration program in Alaska’s OCS in 2012 during the three-month open water season. This program could include drilling multiple wells in both the Beaufort and Chukchi Seas, site clearance surveys and baseline science studies. It is important to note that an exploration program, unlike a development and production program, is a temporary, short-term operation. In the Alaska OCS, an exploration well is anticipated to take approximately 30 days to complete, at which

time the well will be permanently plugged and abandoned and the site cleared. Shell's exploration program will meet or exceed all applicable regulatory requirements for the protection of health, safety and the environment.

Shell is committed to employing world-class technology and experience to ensure a safe, environmentally responsible Arctic exploration program – one that has the smallest possible footprint and no negative impact on North Slope stakeholders or traditional subsistence hunting activities. Aspects of the 2012 program have been under evaluation by federal agencies since 2006. At every step, Shell has worked with federal agencies, the State of Alaska, and local communities to develop a program that achieves the highest technical, operational and environmental standards.

My discussion here focuses on the following points:

1. The currently available science regarding the Arctic is extensive and more than adequate for an exploration program;
2. The shallow water, low pressure Alaska OCS wells differ significantly from Gulf of Mexico deepwater exploratory wells; and
3. The oil spill prevention, containment, mitigation and response plans included in Shell's 2012 Arctic exploration plan are robust and comprehensive.

Arctic Baseline Science

Some argue that there is insufficient scientific data regarding the Arctic and, therefore, exploration in the Chukchi and Beaufort Seas should not go forward. This is not accurate. In fact, the available scientific data is more than adequate to identify and evaluate the impacts of an exploration program that is, by definition, a short-term, temporary operation.

Several thousand environmental, ecological, and socio-economic studies applicable to oil and gas activities in the Arctic OCS have been completed over the last 30 years. The categories of scientific data available include: tides and ocean currents, weather (e.g., wind and its effect on currents, precipitation), ice conditions, baseline environmental data related to species found in the arctic (e.g., benthic, fish, birds, marine mammals, etc.), assessments regarding the impacts of oil and gas exploration activities on those species, and, specifically, information assessing the impacts of an oil spill on those resources, in the highly unlikely event of an incident during exploration drilling.

Since 1973, federal agencies have performed more than 5,000 environmental studies to better understand the Alaska OCS and coastal environment, and document or predict the effects of offshore oil and gas activities. The former Minerals Management Service Environmental Studies Program spent more than \$600 million dollars (more than \$1 billion in inflation adjusted dollars) for studies under the guidance of the OCS Scientific Committee, which advises the Secretary of Interior. About half of these funds have been directed to Alaska.

The advancement of scientific knowledge will continue. This expanded knowledge is critical because it informs government regulators who must issue permits, it informs policymakers who must develop sound energy and environmental policy and it informs our operational decisions. In fact, Shell is contributing to advancing Arctic science in several ways. Since returning to Alaska in 2005, Shell has spent \$60 million engaging in an aggressive environmental studies program in the Arctic offshore. Shell has worked in a collaborative manner with a wide range of stakeholders, including industry partners, local, state, and federal governments, universities, and non-government organizations to share resources and facilitate the further development of our understanding of the Arctic marine ecosystem.

Shell has also taken the lead in the development and implementation of new technologies, including unmanned aerial systems, acoustic recorders, and integrated ecosystem studies to advance capacities to work in this challenging offshore environment. Shell fosters and funds such diverse research as computer assisted identification of marine mammal calls, greatly enhancing the capacity to utilize acoustic sampling technologies, satellite tagging of whales and seals, ice and weather forecasting and physical oceanography.

Recently, the North Slope Borough (NSB) and Shell entered into a multi-year collaborative science agreement that will enable impacted North Slope communities to build capacity for scientific research and independent review of studies, exploration and development plans and regulatory documents. The research program established under this agreement will be guided by an Advisory Committee of representatives from each of the coastal communities (Point Hope, Point Lay, Wainwright, Barrow, Nuiqsut and Kaktovik), scientists from the NSB and Shell, and independent scientists. This committee will be responsible for identifying critical issues, setting investigative priorities, and integrating traditional knowledge with science. The current agreement is between the NSB and Shell, but it anticipates expansion of the studies program through additional funds from third parties, which may include either private or public sources.

If exploration leads to a commercial discovery, even more science will be needed. Consistent with the Outer Continental Shelf Lands Act's (OCSLA) multi-stage process, development and production activities will build on the information gathered through the exploration stage. The first development in the Arctic OCS will require the preparation of an additional environmental impact statement. The issues to be addressed in that document will be determined during a public scoping process. Since 2006, Shell has spent almost \$90 million pre-investing in data acquisition, studies, and research and development that will support environmentally sound offshore development. Information gathered during these earlier OCSLA stages (including exploration) will form the basis for that scoping process, as well as the identification of any issues that may require additional research or study before informed decision making.

This approach was recently validated in the final version of the President's Oil Spill Commission report where it states, "The need for additional research should not be used as a *de facto* moratorium on activity in the Arctic, but instead should be carried out with specific timeframes in mind in order to inform the decision making process."

Exploration in Alaska's OCS vs. Exploration in Deepwater Gulf of Mexico

The drilling conditions for Shell's proposed 2012 Alaska OCS exploration program are typical of wells that have been safely drilled for decades in shallow water around the world. The Alaska OCS wells are in shallow waters and have much lower downhole pressure, which is vastly different from the conditions found in the deep waters of the Gulf of Mexico. This increases the safety margin.

The *Deepwater Horizon* was drilling the Macondo well in 5,000 feet of water and down to a depth of 18,000 feet. The pressure encountered in the Macondo well was about 15,000 psi based on mud weight at total depth. The water depth, well depth and pressure make the Macondo well and other deepwater Gulf of Mexico wells far more technically complex than the shallow wells that will be drilled off the coast of Alaska.

In Alaska's Beaufort Sea, the wells will be in 150 feet of water or less. The wells will be between 7,000 to 10,000 feet deep. We have extensive reservoir pressure models based on previously drilled wells in the

Chukchi and Beaufort Seas that show the pressure at total depth in our initial exploration wells will be no more than 6,000 psi, less than one-third the pressure of Macondo.

With lower anticipated bottomhole pressure in the Alaska wells, all of the mechanical barriers in Shell's well design have higher overall safety margins between operating pressure and mechanical barrier design pressures. Even if the riser from the drill rig to the blow-out preventer on the seafloor was breached, as it was in Macondo, the weight of the drill mud in the downhole pipe would maintain well control and prevent a blowout from happening. To reiterate, Shell's 2012 Arctic well program is exploratory. The well will not be converted to a production well. It will be permanently plugged and abandoned per federal regulations.

Oil Spill Prevention and Response

Oil spill prevention and response planning is a top priority. Shell's Oil Discharge Prevention and Contingency Plan is robust. We have invested in an unprecedented oil spill response capability to support our drilling plans in the Beaufort and Chukchi Seas. Our spill recovery equipment is state-of-the-art, widely acknowledged by experts as proven and effective under cold-climate conditions and designed to remove the worst-case discharge.

Specifically, Shell has developed a three-tier or layer system for use in the Alaska OCS.

1. The first tier is located on site, always less than an hour from the drilling rig. It is a dedicated fleet of purpose-built vessels and specialized oil containment equipment, which will be on-site 24/7 before a drill bit ever touches the sea floor.
2. The second tier is located to capture oil that might move away from the drill rig.
3. The third layer involves pre-staged shoreline protection. This, along with the first two tiers involves extensive use of both local residents and traditional knowledge.

Shell's oil spill response personnel routinely practice and conduct spill response drills. The response system consists of dedicated oil spill response assets including:

- Offshore recovery vessels with skimmers and boom,
- Near-shore barges with skimmer and boom,
- Shallow water vessels with skimmers and boom,
- Pre-identified protection strategies and equipment for environmentally and culturally sensitive sites, and
- Onshore oil spill response teams to deploy and support the above.

These assets are staffed during operation around the clock with trained crews provided by Alaska Clean Seas, Arctic Slope Regional Corporation, and Ukpeaġvik Iñupiat Corporation.

Design Prevention, Containment and Spill Response

Shell has design standards and practices that have enabled us to safely drill many deepwater and shallow water wells worldwide in a variety of conditions, including the Arctic. Shell will rigorously apply these standards in all well operations on the Alaska OCS. As described above, the conditions of the well mean that prevention through the mechanical barriers built into the design have a high margin of safety.

The blow out preventers (BOP) that Shell will use have been extensively maintained, inspected and tested by third party specialists. The BOPs have been validated to comply with the original equipment manufacturer specifications, in accordance with API Recommend Practice No. 53. Shell's BOPs will have two sets of shear rams and comply with all regulatory requirements.

We will also retain the ability to mechanically cap the well in the unlikely event of a BOP breach. In fact, all existing Shell wells, in deep water, around the globe, can be capped. The design and construction of these wells allows them to withstand the pressure build-up that results when the well is capped. If the blow-out maintains mechanical integrity in the borehole and wellhead, a “capping and containment” operation would be employed. Mechanically capping the well, for example with an additional pre-engineered BOP, has the ability to reduce or even stop the flow, but still requires a surface collection system. The benefit of this response methodology is that it reduces or completely halts the flow of oil entering the water column. This capping method was eventually proven successful in terminating the well bore flow even at Macondo, and has been an integral part of well control descriptions in industry’s recently approved permits in the deepwater Gulf of Mexico return to drilling.

In the extremely unlikely event that the wellhead integrity is compromised and an uncontrolled flow occurs, we would employ a pre-fabricated “subsea collection” system. This would consist of a capping stack that would be located on top of the blowout preventor, collecting fluids to a surface barge where gas, oil and water can be separated prior to storage and disposal. Separated gas would be flared; separated oil and water would be stored in tanks for subsequent disposal offsite or flared.

Collecting the flowing fluids close to their source of origin prevents or limits the flow of oil into ocean waters, and optimizes the suite of surface oil spill response capabilities by engaging the problem at its source. Surface oil spill response equipment would remain on station in the immediate area. Given we will have two functional drilling vessels in our 2012 exploration operations, each drilling rig will act as the relief backup well drilling unit for the other. Each can immediately stop operations and respond to drill any ultimate relief well.

Oil in Ice

A significant amount of oil-in-ice research has been completed over the last 30 years and more is underway. A four-year program known as the Joint Industry Project (JIP), under the management of SINTEF Norwegian Research Institute, was sponsored by six international oil companies, including Shell, and involved a host of international scientists including those from the Department of the Interior.

The purpose was to advance knowledge, tools and technologies for oil spill response in ice-covered waters. The program looked at:

- The fate and behavior of oil spilled in Arctic conditions;
- In-situ burning of oil in Arctic and ice-covered waters;
- Mechanical recovery of oil in Arctic and ice-covered waters;
- Use of chemical dispersants in Arctic and ice-covered waters;
- Monitoring and remote sensing of oil in and under ice;
- Preparation of a generic oil spill contingency plan; and
- Field experiments at Svalbard, Norway, in offshore ice-covered waters.

In May 2009, the group spent two weeks in the pack ice in the Norwegian Barents Sea to study the behavior of oil spills in Arctic waters and to test various response options in realistic oil-in-ice conditions. The tests proved that ice acts as a natural boom or protective barrier to confine and reduce the spread of an oil spill and to provide a longer window of opportunity in which clean-up technologies can be used effectively. These tests are the most wide-ranging research and development programs ever undertaken to evaluate Arctic oil spills.

These real-world offshore tests marked the final stage in the largest and most wide-ranging international research and development program ever undertaken to enhance detailed understanding, to further improve and develop spill-response technologies and to increase the ability to react rapidly in the event of an accidental oil spill in ice-covered conditions. The summary of that research showed that by using a suite of available tools (all of which are part of Shell's Alaska tool kit), including Arctic-tested booms and skimmers, and in-situ burning and dispersants, the majority of oil could be cleaned up in a variety of Arctic conditions; including broken ice and slush.

Shell is now leading industry efforts to perform another JIP to continue advancing the technology and research for oil spill response in ice.

Regulatory Challenges

Shell participated in several Alaska OCS lease sales at the invitation of the federal government. Although the leases were issued to Shell, the government's permitting and regulatory process has not been equipped to deliver. As a result, Shell has been blocked from drilling even a single exploration well.

Let me stress that this is *highly* unusual. The federal government's decision to hold a sale is, in effect, a decision that OCS exploration and development is desired. The federal government does years of in-depth analyses before holding an OCS lease sale. Therefore, an exploration or development plan that meets regulatory requirements is permitted. In the case of Shell in Alaska, we have met and exceeded the regulatory requirements and still have not been able to drill a well.

Each of our 414 leases in the Beaufort Sea and the Chukchi Sea has a ten-year term. A lease will expire and return to the federal government at the end of its term, if substantial steps to develop it are not taken.

So, Shell is in a "Catch-22." We have invested more than \$3.5 billion in leases and in supporting infrastructure -- equipment, support vessels, baseline studies, and workforce training -- in order to take the first step to explore for oil and natural gas. We have assembled what is arguably the most environmentally sensitive and thoroughly responsible exploration plan in history. Yet, for reasons largely beyond our control, permits have not been issued. Since our leases are only valid for a limited time, we are keen to move forward.

A Robust Regulatory Process Is Critical

Let me be clear, Shell fully supports a robust permitting process. Shell does not seek lower environmental standards for OCS activities or a less exhaustive public permitting process. Such a process protects people and the environment and ensures safe and responsible operations. The bar is high in the Arctic, and it should be. Shell fully understands and supports this. We are ready to proceed with an exploration program that does precisely that.

But we need a regulatory framework that is clear; and a regulatory process that is properly funded, efficient and robust. The process should lead to timely decisions. Regardless of one's views on oil and gas development, we can all agree that endless delays by our government are wasteful to the taxpayer and should not be tolerated. Permitting for oil and gas activity must be done thoroughly and to the letter of the law. Without that, legal challenges are likely and can also act to block a program.

In the absence of a sound regulatory system, confidence in the U.S. offshore program is undermined. Where OCS leasing has occurred, the government has done literally years of environmental analysis in advance of the lease sale. It has invited companies to buy leases, and it has accepted bonus bids from companies. In return, the government bears responsibility to follow through. There is an expectation that

the government is prepared to do the regulatory work that allows for exploration and development. If this is not the case; if the regulatory system fails to work in support of the leasing program; policymakers should be concerned.

Recommendations: How Do We Move Forward?

Now I would like to look forward - to where we go from here and what policymakers should do.

There is no question that the federal government has a critical role to play as a steward of our oceans. It also has a role to play in supporting the OCS leasing program and the sustainable development of our natural resources. What does this mean?

- It means that federal permitting agencies must have enough staff with appropriate expertise to execute the program, or have the authority to contract with outside experts to do the work. Lack of staff should be no excuse for delaying permitting work.
- It means that the government needs funds to do the environmental studies, ecological characterization and baseline science, that underpins the permitting of any oil and gas work in OCS areas. Lack of funds should be no excuse.
- It means that federal permitting agencies must coordinate and streamline the permitting work. Multiple federal agencies are now involved in issuing multiple federal permits for a single offshore project. Duplication and inefficiency means delay and waste. It should be identified and eliminated.
- It means the regulatory process does not have open-ended timeframes that leave permit applicants with no clear understanding of the permit timeline. Rather, the regulatory process should have a firm timeline for delivering permits and clear milestones marking the path to their delivery.
- It means that the statutes, the regulations and the rules must be clear. It is unreasonable to expect anything less. Only when the rules are clear can a permit applicant meet them.

Fundamentally, it means that the government must respond in a timely and competent manner. Where the government, as the landlord, hands over a federal lease, it must also hand over the “key” to a lessee proposing a responsible program.

The President and members of Congress have called for a government-wide review of burdensome regulations that hinder economic development. I am hopeful that this will result in true reform. With this, we can move forward with responsible development of our rich natural resources such as those in Alaska.

Conclusion

Oil and gas will remain critical sources of energy for decades to come. This is fact. Further, there are broad and sustained benefits in developing our own domestic resources. By tapping our resources here, we will create jobs, power the economy, put billions into dwindling government coffers, provide energy security, reduce imports and reduce our trade deficit. Keeping this economic value here at home, we can at the same time move forward with the investments in the next generation of technologies and energy solutions that will power the future.

Thank you. I am happy to answer any questions.