



# The Arctic – a future licence to operate

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The Arctic Ocean represents the next exploration frontier for oil and gas. Over the next two decades it will succeed the current delivery from deepwater exploration in terms of discovered volumes. Given this context it is important that the industry's future Licence to Operate is clear.

My starting point today is that the "Licence To Operate" (LTO) for the Arctic offshore is not yet established in several of the many different Arctic environments.

For this to change as an industry we need to build a widely shared understanding of the present Arctic context. We need to clearly identify the risks and impacts of Arctic offshore development. And we need to demonstrate that those risks and impacts are being properly managed and mitigated.

I will briefly address four issues key to this end.

Firstly, there is the existing industrial context and the evolution of the oil and gas industry in the Arctic Littoral region - which is, in places, well developed.

Secondly, there are engineering practices that will be required by companies operating in the Arctic in the future; specifically in terms of operational capability, reliability and redundancy.

Thirdly, we have to look to the needs of the Arctic States and the indigenous Arctic littoral communities.

Finally, and perhaps most challenging of all, there will be a requirement of industry and government alike, to show the local and global community that the Arctic Ocean can be developed safely and sustainably.

I will now briefly address these four issues.

## Existing context in the Arctic

The question of the future "License to Operate in the Arctic Ocean" needs to be seen against the backdrop of a long history of existing oil and gas operations onshore.

One of the largest footprints is that of the BP operated Prudhoe Bay field and its satellites.

The Prudhoe complex has produced more than 12bnbblo since 1977. And we believe that the North Slope generally has a remaining resource base of at least double that – so we are no more than 30% done after 35 years.

BP began working in Alaska in 1959, initially exploring in the Brooks Range mountains. We found clues of a petroleum system but no fields. We moved north to the coastal region of the North Slope. And as they say "the rest is history".



Today we operate North America's largest oil field, Prudhoe Bay and in total 15 North Slope oil fields with significant interests in six other producing fields.

We use a range of technologies to minimise the impact of our operations on the delicate Tundra. For example we have learned to use 'extended reach directional drilling' from central well pads, to reduce the surface footprint of our operations.

This allows many more wells to be drilled from a single surface location and it is particularly important as fields age, infill well programmes are undertaken, and the number of wells increases.

Offshore North America, a heritage company of BP, Dome Petroleum, made several oil and gas discoveries in the 1980s in the Beaufort Sea and Arctic Islands of Canada. We still hold these today.

We are the largest exploration acreage holder in the Canadian Beaufort Sea. In 2009 we acquired the industry's highest latitude 3D seismic survey 180km offshore Canada, just along the edge of the migrating ice cap.

We used an ultramodern seismic vessel that was able to acquire the maximum amount of data in the shortest timeframe. Operational flexibility was key as we had to respond to constant satellite data feeds and weather forecasts predicting ice movement.

The crew included local marine mammal observers from Vancouver University. They had a practical task as well as a scientific one. Their scientific role was to record the sightings and behaviours of marine mammals. The practical task was to alert the vessel if a whale was observed within a specified safety radius, in which case operations were paused until the creature moved on.

In Russia, TNK-BP, in which we are 50% shareholders, has several major projects in the Arctic Littoral of the Urengoy/Yamal Peninsula area north of the W Siberian basin.

And on an academic note, BP and several Russian Institutes recently completed a research project to acquire a seismic reflection and refraction profile across the whole Siberian Continental shelf from the Barents Sea to the Bering Sea.

This has been a remarkable scientific enterprise taking several years and involving a large number of British and Russian scientists, and has illuminated a great deal about the tectonics, basin structure and petroleum potential of this remote region.

It is a great example of an International Oil Company contributing to fundamental science and furthering industrial potential.

The underlying point here is that the industry already has a significant footprint in the Arctic-Littoral environment; and has already stepped offshore in exploration. In doing this we have made a start in the offshore Arctic; but clearly there is a long journey of learning ahead.

## Offshore Arctic operations

Moving on then to the topic of engineering practices; as exploration and production operations increasingly step offshore to explore the potential of the Arctic Ocean, the industry is following an established trend.

Middle East exploration started in the Zagros foothills of Persia; moved to the coastal regions of the Arabian Gulf and in the 1950s stepped into the waters of the Gulf.

The same happened in the Gulf of Mexico. After early finds onshore Mexico and the USA; the industry stepped offshore Louisiana and Texas in the 1930s; and then into the deepwater in the 1980s.



With each of these steps, new technology has had to be developed; new practices and standards established; and the prevailing norms of the licence to operate have had to be transferred and modified for the new environment.

In the Arctic Ocean that means ensuring the highest International Standards of our offshore industry, and its duty of care, are applied to Arctic operations.

Our industry will also need to achieve the right level of reliability and redundancy of safety-critical equipment. We have to demonstrate that we have understood and addressed the potential impact of an accident on such a delicate environment; and – needless to say - on the reputation and survival of a company, should an accident occur.

Although ice is the single most unique challenge to operational safety; darkness and extreme cold for six months of the year are also challenges; as is the region's extreme remoteness.

To respond to these challenges, our industry needs to develop new knowledge, technology, and capability in three major areas:

- The first is the Arctic environment itself; the dynamics of ice and the engineering required to deal with it.
- The second is the engineering concepts needed for oil and gas exploration and development among ice, and below it.

There are many environments within the Arctic Ocean with many different types of ice, from ephemeral to permanent ice and from thin, new floes to island sized ice bergs. These extremes clearly present different engineering challenges for fixed infrastructures containing high pressure fluids.

- The third point, and most important of all, is understanding the Safety and operational Risks presented by the Arctic; and in particular, the measures to be taken; firstly to prevent any loss of containment; and secondly to deal with well containment and oil spill response.

This last point has an acute focus for BP because of the tragic accident at the Deepwater Horizon in 2010.

This dreadful event provided BP, and the whole of the exploration and production Industry, with many insights and numerous lessons about offshore operations.

Today we, and many of our colleagues, are applying those lessons globally. We have five areas of focus; the first is about prevention, focusing on well construction and drilling safety- while the others are focused on response - namely well containment, relief wells, and spill response and crisis management.

In the Gulf of Mexico BP set out a series of voluntary commitments for deepwater drilling, and we have changed our standards globally, in many cases going beyond regulatory requirements.

For instance we are using only blowout preventers with six rams, and two blind shear rams, in order to build in a new level of redundancy. Similarly, we have established a new level of inspection of BOPs.

BP has made a point of sharing the detail of these lessons globally with regulators and operators alike. I know that a number of you here today are beneficiaries of that.

In addition to sharing externally what we have learned, we have also focussed on deeply embedding our Operating Management System (OMS) through our Safety and Operational Risk organisation. And also are researching new technology, particularly in the matter of a new generation of high reliability BOPs and Control Systems Technology.



We are also part of the Marine Well Containment Company, established to provide marine well containment equipment and technology for a potential well control incident in the US GoM.

BP also participates in several other initiatives and joint industry programmes – or ‘JIPs’ - concerned specifically with oil spill response in the Arctic areas; such as the Alaska Clean Seas (ACS) and the Norwegian Clean Seas Association for Operating Companies (NOFO). These are spill response organisations with equipment such as barges, skimmers, boom, and heavy equipment, as well as trained personnel.

BP is also active in a Pan-Arctic JIP set up by the International association of Oil and gas Producers. And we fund the Oil & Gas Forum based at the Institute of World Economy and International Affairs in the Russian Academy of Sciences.

Most recently BP joined the JIP on Arctic Oil Spill Response Technology, the largest industry R&D programme of its kind with an investment of \$21.6 million. We also participate in the Barents 2020 Industry Working Group on Arctic Operational Standards.

This brief outline shows the huge effort that is already being put into risk mitigation, and the significant industry capability being deployed.

But all this effort and learning needs to be more powerfully deployed to show the world that our industry can operate safely in the Arctic Ocean.

## Needs of stakeholders

Finally let me offer a perspective on the various stakeholders in the Arctic Ocean and how the industry may need to deal with this.

The “Licence to Operate in the Arctic Ocean” lies with a number of parties with very different interests; The global community outside of the Arctic States; The Arctic States themselves; and the Arctic Littoral communities who have the closest relationship with the Arctic Seas.

The concerns and needs of these stakeholders are very different, each with their own dilemmas.

The Global Community is represented by elected Governments, NGOs, and individuals, not directly linked geographically to the Arctic coastline. They have genuine concerns for a pristine part of the planet with a particular biodiversity that remains largely untouched by man.

Their dilemma is that, while raising legitimate concerns and potentially a desire to prevent Arctic Offshore Development; the global community also continues to demand more energy and the continuation of a mobile life style which is rooted in the energy intensity provided by oil and gas.

The Arctic States, who own the resources, have a different issue. As independent nations their concerns focus on commercialising their resources safely and sustainably with due environmental care; and also the opportunity of building national capability and a new domestic industry.

Sub-sea production capability; a powerful domestic supply chain supporting broader engineering capability; and local content for the Arctic offshore are all a significant prize.

There are also indigenous Arctic Communities, who have the most to gain here and possibly the most to lose.

In Alaska BP works closely with the North Slope Borough and Alaska Eskimo Whaling Commission, to mitigate the impact of operations on a long established way of life.



For the Northstar development local knowledge was invaluable in project planning. For about five years, North Slope residents were engaged with BP in consultation on the field which involved installing the Arctic's first subsea pipeline. Knowledge of ice behavior helped BP engineers decide where to build, and also helped them design edges of the island from ice.

Working with subsistence hunters, BP also designed an acoustical monitoring program to record marine mammal sounds to understand how whales and seals respond to the presence of Northstar.

And from my own interaction with the Inuvialuit of North Canada, I know they are a people who want to see development, and want to see an improvement in their lives and the opportunities for their children. But they also want to see their sea based cultural heritage survive for future generations.

Each of these three groups has different perspectives, power, concerns and needs. And each will play a role in the International E&P industry being successful in the Arctic.

## Transparency

To address these complex, competing and contrasting agendas, the industry faces a challenge as difficult as any engineering breakthrough.

We need to be clear with the World, the Arctic States and the Indigenous Communities, about the safety case for Arctic operations. We need to show them that we can operate in the Arctic Ocean safely and sustainably.

This will require a level of openness and transparency that our industry has not achieved so far. It will challenge beliefs around information and transparency to the very core of our companies.

## In summary

Arguing exceptionalism for the Arctic requires deep care. Our planet has very significant environmental concerns elsewhere, not least in the health of the oceans generally, and the sustainability of tropical rainforests, sensitive mangroves and low-lying delta regions.

Nonetheless several unique factors exist in the Arctic; the receding ice cap is the most significant physical change to any ocean; it has unique biodiversity; it is remote and uniquely inaccessible; and it is the new area of serious global attention.

While the Arctic Ocean remains a pristine environment, the Arctic Littoral has been successfully developed for many years, and the next step, offshore into the Ocean, is a step we have made successfully before, in other parts of the world.

To make this step, new operational norms will be necessary; specifically in terms of capability, reliability and the degree of redundancy required.

For the exploration and production industry to address local, national and global concerns around Arctic Offshore Development, it will need to listen carefully to the needs of a number of distinct stakeholders and respond to them.

And given today's media context, and the environmental sensitivity of the age, it will be key for the industry to be leading this debate with a "radically open and transparent operating stance". Today's meeting in Trondheim is a good step towards such a future.



I believe this represents as great a challenge as any engineering task – but I am confident that our industry can step up to it, and earn that licence to operate.