Engineering the right future

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Introduction

Good evening, ladies and gentlemen. It's a pleasure and a privilege to be with you this evening. In fact, it's special for me as it illuminates for me three important commendations.

First, I realize it's now more than 25 years since I was one of you – preparing to graduate from Imperial College as a chemical engineer and to make my way in the world.

Second, a recognition of how in the intervening quarter century the world has changed – not just of the amount of change, but of the sheer acceleration of change.

And third, I reflect on how engineering and applied science have become central to change. Indeed, it strikes me that the more complex the challenges facing the world become, the more pivotal engineering is to the search for solutions.

That is the essence of what I want to talk about tonight – engineering as a vocation and as a part of the answer to big questions which need to be answered. If we don't find answers, the World will be a much more challenging and dangerous place. If we do find answers, decades and potentially centuries of future prosperity become possible.

I'm talking especially about energy where engineering is crucial. The future is never guaranteed, and engineering the right future today is an imperative for all of us.

Engineering solutions

Herbert Hoover, a renowned engineer who went on to become a much-maligned President of the United States, had an inspiring way of talking about what he called this "great profession": "There is the satisfaction of watching a figment of the imagination emerge through the aid of science to a plan on paper. Then it moves to realization in stone or metal or energy. Then it brings homes to men or women. Then it elevates the standard of living and adds to the comfort of life. This is the engineer's high privilege."

That is certainly an accurate account but I'm not sure it's completely adequate. I don't think it quite captures the key role that engineering has to play in addressing some of the most important issues concerning our future on this planet.

That's the potential of your position as our next generation of engineers, and why you should feel truly excited about what lies ahead for you. The question is how you can play that role and fulfill that potential to best effect.

I believe the answer lies in realizing that engineering does not exist in isolation. It needs to work in close conjunction with policy and politics on the one hand and with business on the other. It needs to

connect with the worlds of ideas and practical commerce and to face up to real choices. It needs to understand the magnitude of what is at stake.

Churchill put it in characteristically stark terms in June 1940 as he contemplated what at the time seemed a catastrophic future for mankind. If Britain failed to halt Hitler, he said:

“The whole world will sink into the abyss of a new Dark Age made more sinister and perhaps more protracted by the lights of perverted science.”

Science in the service of evil could enslave mankind. But what of applied science in the service of the good – in the cause of averting catastrophe?

I’m an optimist and, I like to think, a pragmatist. The two don’t always go together. In the matter of engineering the right future for mankind in the 21st Century, they have to. The alternative is not an encouraging one.

BP and the Gulf of Mexico oil spill

As I said, I will illustrate this by talking about the field I know best, the energy business. I’ll start with recent events involving the company I have worked for since leaving Imperial in 1985, BP.

Just under seven months ago, a drilling rig working on the Macondo well in the deep waters of the Gulf of Mexico exploded, caught fire and sank. Tragically, 11 men lost their lives. And for 87 days thereafter, oil and gas continued to pour from the wellhead 5,000 feet below the surface, with the significant consequences you have all read about and seen on TV.

Everyone at BP is devastated by what has happened – the distress of families over lost loved ones, the damage to livelihoods and the environment along the Gulf coast.

We are doing everything in our power to meet our commitments to make it right. And we have stated our determination to learn and share the lessons from this disaster for the future.

But I want to also talk this evening about the wider significance of this event, because it goes to the very heart of two key issues involving energy and engineering.

There was a good reason why the Macondo well was being drilled in the first place. It’s because the world badly needs the oil and gas that reside beneath the seabed of the Gulf of Mexico, the Atlantic and other oceans in order to meet inexorably growing energy demand.

The majority of world oil reserves are to be found in OPEC countries. However, even if OPEC did not restrain supply, the demand for oil continues to rise and in order to replace depleted reserves and supply that growth, it is still projected that many new sources of oil and gas are presently required. So the international energy industry is having to explore in ever more far-flung and difficult places including the frontiers of the deep seas and oceans.

These frontiers now include the deep waters of the Gulf of Mexico, where BP is the largest producer and largest lease-holder, the Atlantic offshore Angola and Brazil, the Mediterranean off Libya and Egypt and the South China Sea. In the next few years the frontiers will extend into the Arctic, north of Canada and Russia..

Deepwater oil accounts for around 7 per cent of global supplies today, and is projected to grow to 9 per cent in 2020. For the US, the Gulf of Mexico currently supplies 30 per cent of all domestic oil production. Last year, it was the fastest growing oil province in the world.

The second issue raised by the Macondo disaster concerns management of risk and safety in the energy industry. The world needs oil and gas exploration production to be as safe and secure as possible.

Clearly what happened in the Gulf in April was a significant failure. It involved many companies and failures of equipment, processes and human judgement.

A lot of this is about engineering, which is central to achieving delivery of new resources, the management of risk, and the judgments we have to make around it. Exploring for and producing oil and gas in the deep waters is difficult – the work that only a very few large companies with essential technology and engineering skills can carry out. It's a central part of what we at BP do for a living.

That's why the response to what happened in the Gulf this year matters so much. It is of vital strategic importance that we, the rest of our industry and the governments who partner with and oversee us learn and apply the lessons from this accident to make the deep water safer.

The Macondo explosion and subsequent spill was a terrible sequence of events that never should have happened. But it would be another disaster, in my view, if BP and the industry were to fail to learn the lessons and improve. The world cannot afford not to keep drilling in the deep water. And it certainly cannot afford another accident like this one.

How to keep delivering oil and gas at these difficult frontiers is one of the those very big questions I referred to at the start of my remarks, to which engineering holds the key.