MARSH

NATIONAL OIL COMPANIES CONFERENCE 2016

A SUMMARY OF KEY NEWS AND INSIGHTS FROM MARSH'S NOC CONFERENCE IN DUBAI

We are on the cusp of a New Era in Energy Risks. Threats from traditional risks such as natural disasters, political violence, market volatility, and contingent business interruption are on the rise, while, at the same time, newer risks, such as cyber-attack, aging workforces, social media, and disruptive technologies, are emerging at a startling rate.

All this is going on at a time when reduced revenues resulting from the low oil price have placed additional strain on energy companies, which have been forced to consider withdrawing investment in new projects and cutting staffing numbers. Meanwhile, a sustained soft market persists in the energy insurance sector; this is placing further pressure on already low insurance premiums, which appear set to remain low for the foreseeable future.

It was against this backdrop that we held our sixth National Oil Companies (NOC) Conference in Dubai on March 22-24, 2016, which attracted more than 450 global industry leaders and key influencers from energy companies around the world.

The conference addressed the current a myriad of other topics, ranging from renewable energy strategies, to futureproofing of the insurance sector, and the economics of decommissioning energy assets.

This publication provides a summary of the discussions and workshops that took place in Dubai. We have split these into the following four categories: opportunities, risks, geopolitics, and the insurance market. We also summarize the several pieces of thought leadership we published during the event on page 31.

We would like thank our sponsors, speakers, and all attendees for their participation in this year's event. We look forward to continuing this thought provoking dialogue with you over the coming weeks and months.

Andrew George
Chairman, Energy and Power Practice, Marsh

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BEWARE OF REPUTATIONAL RISK IN THE SEARCH FOR OPPORTUNITY

Companies must be mindful of the challenge posed by reputational risk in order to take advantage of global growth opportunities, according to Abdulrahman Shamsaddin, General Manager, Enterprise Risk Management at SABIC.

Speaking at this year's National Oil Companies conference, Mr. Shamsaddin told delegates that, despite stagnation in the West and the economic slowdown in China, opportunities continue to exist in emerging economies, which today contribute more than half (57%) of global GDP, compared to just 36% in a quarter of a century ago.

But he warned that cross-border expansion into new territories is not without risk. "The momentum continues to shift to other parts of the globe," said Mr. Shamsaddin. "There are emerging economies where there is opportunity for companies, but with that opportunity comes a different kind of risk, in the form of reputation and branding risks."

"The fastest way to destroy a company's value today is to damage reputation," Mr. Shamsaddin told delegates, citing recent incidents including Deepwater Horizon and the 2014 emissions scandal and the impact each had on brand value. In the latter case, rating agencies even downgraded the automotive manufacturing company on the very same day that the story broke.

Yet despite these high-profile events, Mr. Shamsaddin said the majority of companies do an inadequate job of managing their reputations, saying that they tend to focus their energies on handling threats that have already surfaced as opposed to those that could one day emerge in the future. "That is not risk management; that is crisis management."

Speaking about opportunities in Africa and Latin America, Mr. Shamsaddin pointed to research published in the World Economic Forum's *Global Risks Report 2016*, which showed that geopolitical and social risks are considered to be the highest concerns for those doing business in the regions.
"Inclusive of those risks is the failure of national governance, unemployment, and the failure of critical infrastructure, including financial institutions," said Mr. Shamsaddin. "These are the exact

reasons that promote corruption, mistrust, and the failure of financial statements and reporting, which are the key drivers of reputational risk."

Warning about the interconnectivity of reputational risk, which can arise from a range of strategic, business, and operational risks, Mr. Shamsaddin said that "reputational risks are more complex to manage and therefore, require a different set of capabilities to be managed well."

He concluded by saying that successful growth requires "stronger capabilities to manage more complex and interconnected risks, particularly those affecting branding and reputation." Leadership on the issue, he said, is key, as is the development of third-party relationships with regulators, communications and media strategies, effective infrastructure for financial performance and reporting, and human capabilities to deal with red flags and weak signals.

One third of participants said their company was looking at expanding into new regions over the next year.*

* Marsh survey of NOC delegates

ACCELERATED WAVE OF DECOMMISSIONING ACTIVITY TO COME

The oil and gas sector is facing an accelerated wave of decommissioning activity as a result of low oil prices and the changing mix of energy sources, according to Francois Austin, Senior Partner at Oliver Wyman.

The world is entering a "new era," Mr. Austin began by telling delegates. Whereas previous price fluctuations have been the result of political or geopolitical events, what has happened over the last two years has been driven by supply and demand. Between 2006 and 2014, all major producing areas increased production, all major International Oil Companies (IOCs) and NOCs set new record levels of capital expenditure on new projects and development, which has led to the point where, today, every major IOC and the vast majority of NOCs are producing at record levels.

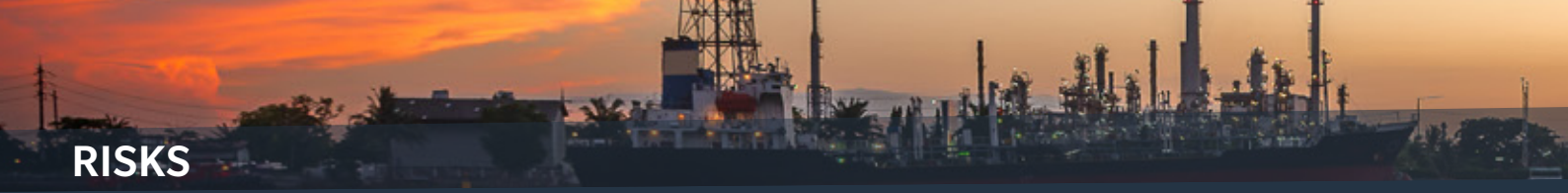
On top of the supply and demand equation, Mr. Austin spoke about a number of other industry disruptors to challenge the status quo. Demand has significantly decreased in Europe, China, and elsewhere, while government regulation has "fundamentally changed the energy mix…a huge shift from a fossil fuels-based economy to a renewable-based one." In addition, said Mr. Austin, new extraction technologies and improvements in technological efficiency mean that "the energy mix will change as a result."

"We will go back to oil and gas representing, in terms of the fuel mix, what it represented back in 70s within a 20-year time period," he said. "The investment that is going into other forms of energy is significant. Last year, 49% of all EU generation was renewable generation. Renewable generation investment is going up by 20% year-on-year and, importantly, 36% in China and 40% in emerging markets. It's not going to take over everything that we're doing but it is a factor."

Mr. Austin said that all off these contributors mean that the low oil price environment "is not something that is going to go away. I think we are in a state of a lower for longer period."

Over the past 20 years, approximately US$9 billion has been spent on decommissioning offshore oil and gas assets. However, Mr. Austin warned delegates that, due to the disrupting challenges the industry faces, "in 2018, we expect that we will see US$10 billion spent on decommissioning in that one year."

"In the next 10 years, our expectation is that we will see spending somewhere in the order of US$70 billion," he went on to say. "But I expect that number could be closer to US$100 billion, and that the forecast for the next 50 years is that we could spend US$200 billion in the context of decommissioning assets. And I think a lot of organizations, operators, contractors, and insurers are probably not totally and utterly equipped for the wave that is about to come through."



RISKS

Decommissioning in a world of US$80-US$100 per barrel of oil represents almost a natural evolution of assets; companies explore, develop, produce, and then decommission, all of which takes place over a long period. However, in a world of US$30-US$50 per barrel of oil, Mr. Austin said this is "quite a different thing, because it's a combination of not just the economic viability of the wells in terms of the reserves that are there, but effectively the economic viability given the price points that are there."
The result, he said, that is that organizations are going to have to start thinking quite differently about decommissioning, adding that "decommissioning needs to be at the heart of the strategy of operators, of insurers, and certain parts of the contracting world."

Fortunately for the Middle East, said Mr. Austin, the good news is that the region can produce product at a significantly lower cost than can be done elsewhere, which advantages the assets that are in the region. Today, even some parts of the unconventional world are viable at US$40-US$45 per barrel. The question, said Mr. Austin, "is really going to be around some of the other assets, for example, some of the ultra-deep assets and their economic viability going forward."

Approximately 80%-90% of oil and gas assets are viable in terms of production at US$60 per barrel in the Middle East. However, that falls to 30% in the rest of the world. As a result, said Mr. Austin, "organizations are going to have to ask themselves questions as they review their portfolios in light of the economics as to really what makes sense. And decommissioning of these assets is going to happen sooner than maybe some people had planned."

Decommissioning will increase as profitable asset divestment is no longer possible in a low oil price world

© Oliver Wyman | CHI-UTL93401_Decommissioning

"There is no doubt that we will see renewed interest in some of the assets that are considered to be the safest of assets, rather than those considered the riskiest assets, which poses some real challenges to some of the IOCs in terms of their core capabilities and what they're particularly good at as opposed to what some of the NOCs are good at and the advantaged asset classes they've actually got."

Organizations in possession of these high-risk assets have three choices: One, to continue to drive production, and monetize the product because, if don't, they may not have a chance to monetize it at a future date given the mix that's going on; two, some element of temporary cessation in order to manage the resources they have and their balance sheets in a more effective way; and, three, to asset dispose. Mr. Austin said that it is the latter, which is taking place.

IOCs are increasing the amounts set aside for decommissioning in their annual accounts year-on-year; Shell has set aside US$22 billion, up from US$12 billion five years ago, BP's figures have gone from US$10 billion to US$20 billion, and Total's from US$7.5 billion to US$17 billion.

However, Mr. Austin concluded by saying: "There is a huge opportunity to drive a new collaborative model across operators to address this wave of decommissioning." He called on the industry to learn from the success of tier 2s in the North Sea and the Gulf of Mexico, which had experienced 20%-30% reductions in supply chain costs associated with decommissioning and 50% improvements in lead time in terms of delivering, mainly through the sharing of knowledge and information.

"There is also a requirement for operators, insurers, and contractors to work with governments and regulators to create the right environment to enable this wave of activity to go ahead in a way that is not more disruptive than it could be."

The vast majority of organizations (79%) said they expect to see more decommissioning over the next year*.

* Marsh survey of NOC conference delegates

COMPANIES MUST BE NIMBLE TO MITIGATE CYBER THREAT

The cyber threat to energy companies is increasing its diversity and organizations must develop a dynamic and ongoing cyber risk strategy in order to mitigate the risk, according to Eric Eifert, Senior Vice President, Managed Security Practice at DarkMatter.

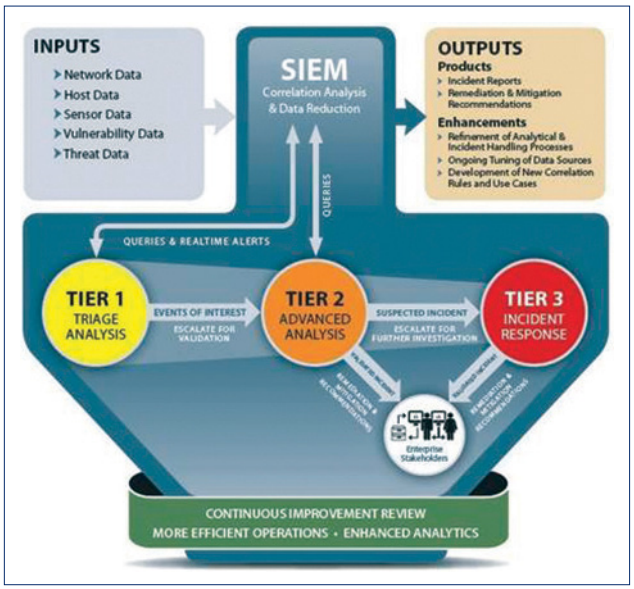
Hackers are "ever increasing in their diversity," Mr. Eifert told delegates at this year's conference, and include state hackers, environmentalists, non-state-sponsored terrorists, and organized criminals. In addition, he said he had witnessed a high increase in insider threats.

The risks to the energy industry include those to intellectual property, reputation, and the disruption of operations. In terms of intellectual property, Mr. Eifert said that threat actors were increasingly "interested in the oil exploration – what organisations were doing, where they were going, and what they were investing money in to explore new sources of oil" in addition to "the types of proprietary techniques to extract types of oil."

Mr. Eifert also spoke about an increase in attacks on industrial control systems, and highlighted an instance of a complex, multipronged attack against a Ukrainian power company in December 2015, which he said was proof "of how the power industry is susceptible to a cyber-attack that can cause physical damage and disruption to people."

The attack remotely accessed the control system and then disconnected power at the substations. On top of that, the attackers used the cyber-attack to wipe the hard-drive, thereby destroying that workstation, meaning that operators had to drive

Mitigating the risk – Increase your visibility



to each of the individual substations to fix the problem manually. A telephonic denial of service attack was also launched, preventing the call center from getting legitimate complaints that the power was out, meaning that it was unaware of the issue for some time after the event.

In order to combat the threat, Mr. Eifert encouraged organizations to develop "a programmatic type of approach," adding that "this is not something that you do once, walk away, and then 10 years later do again. It's a continuous process that requires continuous evaluation and continuous improvement."

He concluded his presentation by advising delegates to adopt the following three-stage approach: First, understand your assets (including corporate systems, research and development, suppliers and contractors, industrial control systems, operational technologies, and intellectual property); second, understand who the threats to the organization are and extrapolate from that as to their capabilities; and finally, understand the vulnerabilities, primarily its people process and technologies.

One third of organizations said their focus on cyber has changed drastically over the past two years*.

* Marsh survey of NOC conference delegates

CYBER: IMPENDING DOOM OR FALSE DAWN?

A recent survey of more than 500 companies worldwide showed that the risk of a cyber-attack is deemed to be the number one risk in 2016. Over the last several years, there have been a number of reported attacks, but this is only the tip of the iceberg. For every major incident that is reported in the news, there are many more that go unreported. With attacks aimed at the energy industry increasing, this is now the "hot topic" that organizations need to address.

More than 20 years ago, the systems used in our industry were often closed-loop, with just a handful of individuals having access at any one time. Today, however, in a world where technology is constantly developing and evolving, so is the risk of attack. It has been said that it is no longer a case of "if" but "when." According to the director of the FBI, there are only two types of companies; those who have been hacked, and those who don't know they have been hacked.

Another recent poll has demonstrated that, against common belief, it is not necessarily the region in which a company operates that correlates directly with the possibility of an attack. The study revealed that the likeliest threat will come from a malicious insider, followed by criminal syndicates, and lastly a nation state-sponsored attack.

The consequences of an attack on an oil and gas company can be severe and include:

- Business interruption.
- Reputational damage.
- Damage to critical infrastructure.
- Loss of intellectual property (such as geoscience data for new wells).

Marsh recognizes that cyber is a real and tangible risk for our clients. While almost all current policies have a clear cyber exclusion, the exposure falls within the parameters of how an insurable risk is defined; it is sudden and accidental, unforeseen, and risk assessment is feasible.

The following are three of the main exclusions typically seen in policies:

1. Institute Cyber-Attack Exclusion Clause CL380 applies to the all risk or package policy.
2. Electronic Data Exclusion NMA2914 applies to the all risk policy.
3. Computer hacking and computer virus exclusion contained in terrorism policies (for example, T3 LMA3030).

"According to the director of the FBI, there are only two types of companies: those who have been hacked, and those who don't know they have been hacked."

LINKING ERM TO OPERATIONAL RISK

Enterprise risk management (ERM) is the process of planning, organizing, leading, and controlling the activities of an organization in order to minimize the effects of risk on an organization's capital and earnings.

Organizations need to assess the risks they face when seeking to achieve objectives and attain desired levels of reward. In the current economic climate, these threats include:

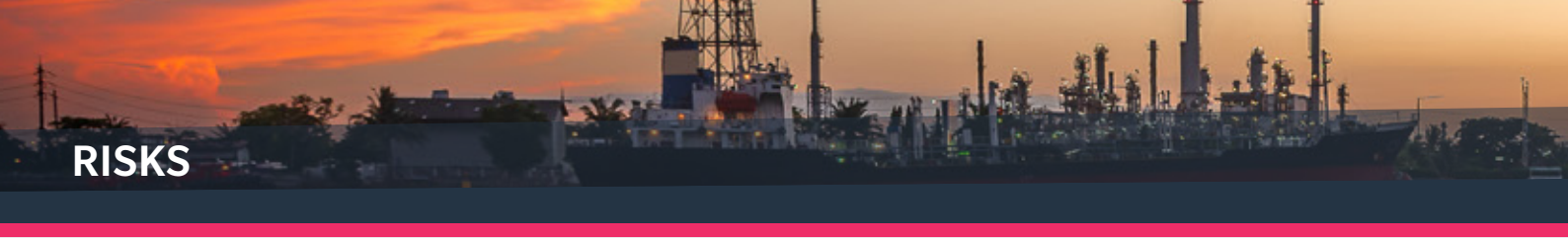
- Involuntary migration – A general term that refers to the movements of refugees and internally displaced people (those displaced by conflicts within their country of origin), as well as people displaced by natural or environmental disasters, chemical or nuclear disasters, famine, or development projects.
- State collapse – A political body that has disintegrated to a point where basic conditions and responsibilities of a sovereign government no longer function properly (as seen in Syria).
- Interstate conflict.
- High unemployment.
- National governance failures.

Today, a proliferation of global risks – many of which have resulted from the global financial crisis – have made risk management in the energy industry more important than ever. The low oil price has added to this challenging environment, and governments, IOCs, and NOCs need to keep a close eye on the risks associated with this, including the diversification of income streams into adjacent activities; new risk-return profiles for companies operating in the downstream sector; and an increased exposure to foreign regulation through internationalization, such as an increase in government take or the modification of production sharing agreements (PSAs).

Reductions in capital and operational expenditure have contributed to the cessation or freezing of lower-return projects and the reduction of reservoir management activities, which can jeopardize future revenues and competitiveness and increase an organization's risk profile. The resulting pressure on suppliers may lead to consolidation, which could impact the balance of power in the industry, while supplier default may drive the risk of supplier replacement. Most importantly, by reducing capital and operational expenditure, an organization is potentially faced with increased operational risks associated with aging infrastructure, loss of productivity, and impaired health and safety standards.

ERM can help organizations to navigate and manage the global risks the energy sector is facing in several ways. For example, risk-return information can be used to support all major strategic decision-making processes and, therefore, this information must be shared across the organization, from board members to employees working on the manufacturing floor.

"A proliferation of global risks… have made risk management in the energy industry more important than ever."



RISKS

The responsibility for reviewing and approving company ERM programs should lie with senior leaders and should focus on the following three areas:

1. Data – What information is critical to understand how operational risks are being managed? A lack of data or limited insight from existing data can hamper leaders in their understanding of this.

2. Management systems – What are the risks faced and what questions should be asked? Boards/risk committees must understand the operations management system: Is it understood by operations? Is it used by operations? Are operational risks identified and managed?

3. Role – What is my role in making sure operational risks are effectively managed? All leaders have a role in managing these risks, despite any organizational and/or geographic distance. Building a high awareness of the risks and the role of each person is important, as is building trust in the leaders and their vision.

The implementation of large-scale changes to support ERM must also crucially be supported by the management of change (MoC) process, which ensures that procedures are identified, tools made available, training provided, and buy-in secured from employees etc. According to Marsh's risk ranking and benchmarking database, 17% of risk improvement recommendations relate to risk assessment processes, including MoC. Organizations must work to identify procedures, make tools available, provide training, and secure buy-in from senior management and employees, otherwise, inadequate MoC processes, combined with ineffective risk mitigation, are very likely to result in increased operational risk. However, the current cost cutting measures in place within many organizations are likely to impede the implementation of these changes and may further exacerbate existing weaknesses.

Due to the challenges faced by the energy industry, it is now more important than ever for organizations to assess their external and internal risks. They need to make sure that different tiers of management and employees understand company risks at all levels, including how they are linked together and affect one another: Buy-in commitment to action across the whole organization is an integral part of ERM.

It is now more important than ever for organizations to assess their external and internal risks.

POLITICAL VIOLENCE: LIVING WITH THE NEW NORMAL

Political violence-related incidents are growing in frequency and, more often than not, difficult to predict. Today, the issue is not a country or a regional one – it is a truly global threat. Over the last 10 years, the face of terrorism has changed from calculated, large-scale attack to smaller-scale "lone wolf" acts that have minimum property damage, but often a tragic impact on human life. This "new normal" was acutely highlighted with the Brussels airport bombings that occurred at the same time as the conference.

A total of 15 different nationalities were present in the workshop, of which more than 70% represented a country that has been the victim of a terrorist attack within the last decade. The likelihood of being affected by a political violence incident is high within the oil and gas industry which, in 2015, experienced 214 attacks on facilities around the world.

Maintaining a high-value asset in the middle of a high-risk country or political conflict zone requires a high level of engagement with local communities from a very early stage, as well as investment in local stakeholders. Intelligence gathering is another important element of helping businesses to plan effectively and understand the political situation in a particular region they are operating in. This should include professional, corroborated security information that enables the assessment of geopolitical risk, and the implementation of effective business continuity plans in the immediate aftermath of an incident. The impact of acting without timely and accurate information often has a huge human, financial, and reputational cost.

With worldwide capacity in the terrorism market in excess of US$4 billion and several reinsurance pools accessible to buyers, the challenge for the insurance industry is not the provision of capacity, but the ability to gather information and responding to an incident. Therefore, the need for market intelligence, fluid information flow, and a transparent insurance-purchasing process is essential to allow the insurance market to provide a relevant insurance product and respond effectively at the time of an incident.

The requirement to gather expert data and intelligence that enable preparedness, both operationally and from an insurance perspective, is essential for organizations to survive and thrive in this era of political violence.

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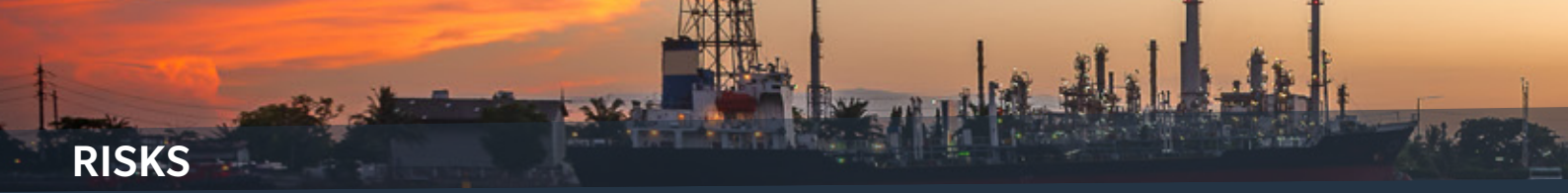


TALENT RISK

Perhaps the greatest threat to a company's future success is talent risk. The issue can be broken into two simple questions: "What talent do I require to meet my strategy objectives?" and "How do I attract and retain that talent?" While two simply phrased questions, the level of complexity in providing an answer is what makes talent risk one of the biggest threats. If we throw into the mix the cost-cutting measures occurring in the energy sector in response to the low oil price, you begin to see the difficulties facing the industry.

Since the beginning of 2015, it is estimated that more than 250,000 people have been laid off in the energy sector. It has largely been a strategy to help balance sheets and maintain shareholder confidence during difficult times, a relatively short-term measure until the oil price rebounded. Eighteen months later and the oil price remains low. Energy companies are now developing strategies to structurally change their organizations in order to have core workforces that are elastic and can adapt. The austerity measures, however, create several challenges. Wage freezes, training cutbacks, and restrictions on talent acquisition are hindering energy companies from being nimble. Let us also not forget that before the low oil price era there were already significant issues facing the industry: demographic challenges, a lack of diversity, and talent shortages in emerging economies. Mercer's *Oil and Gas Talent Outlook 2015 – 2025* report revealed that, out of 10 critical roles, there would be a substantial shortage in six of these by 2025, a shortage to balance in three, and a potential surplus in only one.

Revenues from oil and gas have been significant to the Middle East; therefore, in the current environment, managing talent will be important to ensure the industry continues to thrive.

Talent risk is often looked at from the perspective of the company, but there is also the other side, the impact on employees. Employees want engaging jobs, career development, and equal opportunities.

The master class covered a range of other issues, including:

- Demographic imbalances: The demographics of emerging economies in Africa and Asia show a top-heavy workforce in younger and less experienced staff and a lack of proficient staff in critical roles. The same profile can be applied to the Middle East. Organizations, therefore, need need to consider how to overcome these challenges.
- Time to proficiency: Roles such as engineers and geologists take years of development before the person can be considered an expert, often decades. This means planning the workforce of the future is key. However, if workforces are to be elastic and nimble, it is unacceptable for proficiency to take decades. New methods of development for the future workforce must be considered.
- Talent shortage: While difficult to accept in an industry where there have been significant redundancies, as mentioned, the Mercer survey has highlighted substantial shortages in six critical roles.
- The growing diversity of workforce and customers: Two thirds of graduates will be from emerging economies by 2021. Increasingly, multigenerational workforces and statistical evidence continues to show that the empowerment of women leads to greater productivity for organizations.
- Disruption through technology: We are on the dawn of the artificial intelligence era. It is predicted that 40% of the existing jobs will disappear in the next 10-15 years.
- Swell of big data: The accuracy and completeness of data that is being used to make major decisions is increasing. Can there be such a thing as too much analysis and data?
- Employee stress and productivity pressure: The age of "always on" technology means the lines between work and home are increasingly blurred, and is potentially resulting in a data overload of employees who are increasingly having to self-manage their careers.
- Fragmentation of the workforce: Increasing numbers of part-time and zero-hour employees, and a greater use of joint ventures, partnerships, and contractors in delivering big projects.

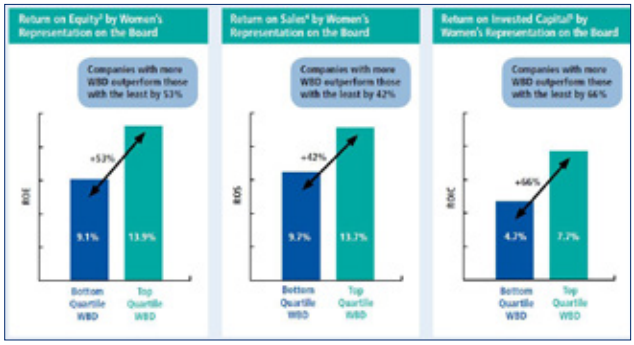
The focus for HR in order to manage these issues in the future will be to continue to migrate toward being a strategic enabler of the business. This will require both a change in the skills of the HR function in order to support that strategic shift, and also the development of data and insight to support and even drive business decisions to manage talent risk.

BOARDROOM DIVERSITY WOULD RAISE PERFORMANCE OF GCC COMPANIES

Good governance and diversity in the boardroom is lacking in the Gulf Cooperation Council (GCC) region and companies must work to advance both in order to improve their performance, according to Mutlaq Al-Morished, CEO of Tasnee.

Boards must be effective for organisations to be properly governed, said Mr. Al-Morished, who argued that "this is a problem in our part of the world" and attacked the nepotism he perceived to be involved in certain board appointments in the region.

Gender diversity has been linked to better financial performance



http://www.catalyst.org/system/files/The_Bottom_Line_Corporate_Performance_and_Womens_Representation_on_Boards.pdf

"It's who you know, not what you know. And that is the problem," he said. "Most boards [in the region] have very, very little structure – it's more like a friendly club, where people know each other and don't want to hurt the feelings of one another. It's not the same sort of structure as you see in a North American or European corporation, for example."

"You have for example, chairmen who mix their hat with the CEO hat, so-called operating chairmen – this is a problem," he said. "Most countries today in the GCC do not allow combining the CEO with the chairman, but in reality sometimes this happens and we have to be aware and try to stay away from that kind of thing." Structures such as these often prohibit proper self-evaluation and performance reviews, said Mr. Al-Morished, who welcomed new rules to bring in third-party reviews.

"In the GCC, gender diversity on boards is the exception rather than the rule."

MUTLAQ AL-MORISHED, CEO, TASNEE

He went on to say that the majority of boards in the region are relatively small, with between eight and 10 members, and that, as a result, there was very little cross-appointment to bring in different mentalities and ways of thinking. Part of this, he added, was due to a lack of diversity in boardrooms in the region, which he believes is "a key ingredient of good corporate governance." Referring to research that showed that companies with more women in the boardroom outperform those with the least by 53% in terms of return on investment, by 42% in terms of return on sales, and by 66% in terms of return on investment capital*. Mr. Al-Morished said that diversity in the boardroom is "clearly a benefit that no one can dispute."

Yet despite this, he went on to express concern that "in the GCC, gender diversity on boards is the exception rather than the rule" and encouraged companies in the region to recognise the specific challenges faced by women in rising up the corporate ladder and support diversity programs and networking opportunities to allow them to excel.

While Mr. Al-Morished revealed that he is personally against the type of quotas that are in place in countries such as Germany, Norway, France, and Spain, he said that "in certain parts of the world, like the GCC, I would actually agree with quotas. You need initiation... Once we get it going, it will carry on by itself."

*The Bottom Line: Corporate Performance and Women's Representation on Boards, Catalyst, October 2007.

LONG-TERM ENERGY FUNDAMENTALS A POSITIVE FOR PRIVATE EQUITY INVESTORS

Despite recent market turmoil, significant opportunity continues to exist in the energy market for private equity investors, due to the long-term fundamentals including favorable demand-supply dynamics and the need for energy infrastructure across the value chain, according to Huda Al Lawati, Head of Private Equity MENA at Abraaj Group.

The energy sector has seen a lot of volatility in recent years, not the least because of commodity prices, geopolitics, and environmental concerns. However, Ms. Al Lawati told delegates that increasing urbanization and mobility, the growing middle class, and historic underinvestment in infrastructure were all positive indicators for the sector going forward.

"The supply and demand equation, in the long term, is extremely compelling," she said, pointing to internal analysis which predicted a 96% increase in global energy demand from growth economies by 2035, which are expected to produce 70% of the global fuel supply in the same year.

Ms. Al Lawati went on to point out that this expected growth would need to be supported by investment in energy infrastructure, which "has seen a lot of underinvestment across the value chain." This lack of investment translates into a long-term and sustainable opportunity for private equity investment, due to the potential to scale up power generation and also take advantage of the unbundling of state-owned utility companies.

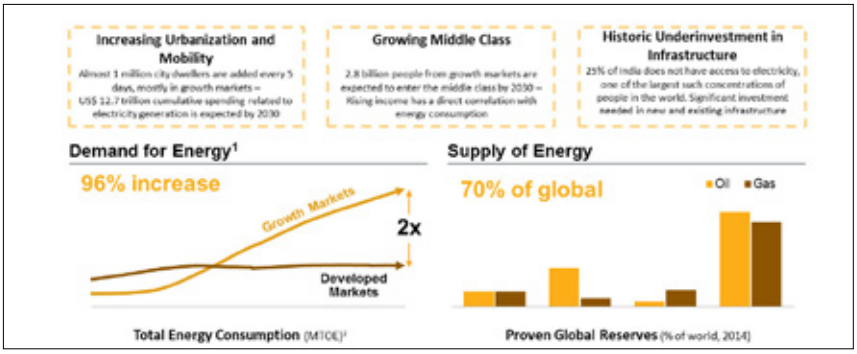
Limiting factors persist in certain parts of the world, however, including stringent regulation and a lack of competition, and Ms. Al Lawati concluded by telling delegates that it was no coincidence

that high-growth markets are, in the main, those that have witnessed a marked improvement in regulatory and governance frameworks, thereby enabling positive investment environments.

Renewable power generation was cited as the most attractive sub-sector for investment by nearly half (47%) of participants.*

* Marsh survey of NOC delegates

Energy demand in growth markets increasing



1 Non-OECD Countries used as proxy for growth markets, OECD Countries used as proxy for developed markets; 2 Million Tons of Oil Equivalent Sources: Abraaj internal analysis, British Petroleum Energy Outlook 20135 (published February 2015), British Petroleum Statistical Review of World Energy (published June 2015), Royal Bank of Scotland, Economist Intelligence Unit, United Nations, World Bank, Brookings Institution, Past performance is not indicative of future results. Nothing contained herein should be deemed to be a prediction or projection of future performance.

BIG DATA

Since the boom of the digital age in the 1990s, firms around the world have been increasingly investing a significant amount of time, resource, and expense in the capture, analysis, and sharing of data.

From the information we post on social media every day, through to facts and figures gathered by large, blue chip, multinational companies, there has never been such an abundance of data easily accessible on a global scale. Today, companies consider data and analytics to be an essential strategy they must take in order to help give them the competitive edge they need when it comes to their decision-making and future planning, such as:

- Medical enhancement – tracking the spread or evolution of a virus or the success of a new treatment.
- Capitalizing on the latest trends in fashion, entertainment, and/or culture.
- Assessing market data (for example, stocks, rates, prices of goods, etc.).
- Advertising on social media.
- Planning for the future (including trends in harvesting, population growth, natural catastrophe events, etc.).

For reasons such as these, it is widely accepted that technology and the use of data is one of the biggest "game changers" the insurance industry is likely to face in the very near future.

Within the insurance industry, benchmarking risks against the potential severity of loss has been a tried and tested method of establishing premiums and rating levels for centuries. What has changed in recent years is the abundance, quality, and accuracy of information which is collected, stored, and assessed that can be turned into data. This quantity of data can then be used to provide extremely detailed and accurate pictures of market trends, likelihood of loss, and comparisons of risks per region, creating seemingly endless possibilities for assisting clients with assessing their risk tolerance.

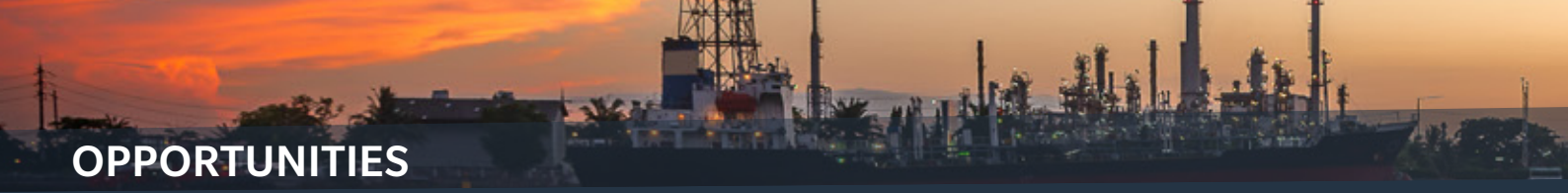
Nobody has the ability to predict the future with 100% accuracy. However, what we can do is predict future trends with an increasing degree of accuracy via the collection, analysis, and extrapolation of detailed historical data. The insurance market, brokers, and clients are all keen to use this data to their advantage. For example:

What we can do is predict future trends with an increasing degree of accuracy.

- Underwriters can use data to assess their rating models and ensure they accurately apply correct levels of premium to each risk.
- Brokers can use this data to discuss, in collaboration with clients, a bespoke placement structure designed to fit in with their risk appetites.
- Brokers can predict market future trends in any given scenario.

Other key points discussed in this workshop included:

- Data can be used to track risk quality, such as the trends in risk improvements.
- Data can be used to compare plant capacity, throughput, and values with other similar types of assets.
- With the advancement of data collection, assessing the frequency and severity of losses over a period of time can provide a detailed, accurate picture of where any risk is in comparison to a loss event. This can be broken down to product, region, size, capacity, limits, and so on.
- Insureds' decisions can be influenced according to their risk appetites by studying industry trends over a prolonged period. Comparing insureds' own risks against those faced by their peers may radically change their perception of risk transfer.
- As the reliance of data increases, it has the potential to change the risk transfer process as we know it.
- Today's reliance on data means that we are potentially on the cusp of modernizing the way the insurance industry views, measures, calculates, and assesses risks. What will this mean to the way insurance is handled going forward and the likely extent any such changes will make? We are sure to find out soon enough.



PROSPERING FROM THE INEVITABLE RISE IN RENEWABLE ENERGY

The recent focus on renewables is borne out of many environmental, political, and technological considerations. Today, however, the challenging hydrocarbon environment and the long-term likelihood that this will remain the case, presents a series of challenges and opportunities for the renewable energy sector.

Technology has developed immensely since the 1990s, and through the lessons learned from the losses experienced in the sector, insurers have had to respond in order to ensure the insurability of these risks. Investors in renewable energy projects want to ensure they prosper too, so long-term investment planning, regulatory regimes, and financial modeling, while promoting growth, are all of the utmost importance in the renewable project space. In this emerging market, growth and continual evolution is essential to ensure longevity and enable the industry to achieve its full potential.

The focus on renewables and natural resource conservation is, in part, a result of the moral obligation to pursue environmentally friendly technologies and the knowledge that we will eventually run out of hydrocarbons. This is reinforced by such articles as the IPCC Assessment Report 5, released in November 2013, which provides a scientific basis for anthropogenic global warming and a data model that is difficult to challenge.

The potential impact is significant when you consider that:

- 90% of anthropogenic greenhouse gas is CO^2[i].
- 69% of CO^2 is from energy and the combustion of hydrocarbons[ii].
- Current predictions expect "peak carbon" output could be as early as 2020 at the current rate of renewable energy development. The acceleration of carbon emissions reaching a plateau is to be welcomed, and, with continued development, can begin to reduce.

Other key points discussed in this workshop included:

- Environmental and political context:
  - Air quality:
    - There are seven million deaths per year from air pollution globally[iii].
    - There are in excess of 250,000 deaths per year in China due to coal-fired power pollution[iv].
    - Nuclear power has resulted in fewer than 60 deaths in total (all from Chernobyl).
  - Of the CO^2 emissions emitted within the EU, 60% are covered by the Emissions Trading Scheme (ETS) and CO^2 pricing. The highest of all regions globally[v].
  - Of the CO^2 emissions emitted within the Middle East, 63% are from subsidised fossil fuels and implicit CO^2 subsidized. The highest of all regions globally.
  - Barriers to renewable energy growth include:
    - Financing complexity.
    - Regulatory complexity.
    - Integration cost complexity for variable generation.
    - Technical issues for back-up power.
- Technology development:
  - Onshore wind capacity has increased from 150kW to 3,500kW since 1990.
  - Annual insurance premiums per kW have decreased from US$3.20 to US$0.75 since 1990.
- The Saudi Arabian power sector:
  - Power generation in Saudi Arabia is mainly fueled by crude oil.
  - There are high-demand peaks, an inefficient generation portfolio, old facilities, and a monopolistic system.
  - There is huge potential for renewables in the country, due to:
    - Plans to bring energy intensity in line with G7 nations by 2020.
    - A strong focus on solar and wind.
    - Targeted energy efficiency savings equivalent to 37GW of new capacity by 2032.

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i. IPCC Assessment Report 5.

ii. IEA estimates 2010.

iii. World Health Organization.

iv. Greenpeace.

v. World Energy Council – Balancing the energy trilemma.

SHIFT TO A MULTI-POLAR WORLD TO RESULT IN GREATER GLOBAL INSTABILITY

The waning influence of the United States (US) and shift to a multi-polar world will bring about greater global instability in the years to come, according to Yoel Sano, Head of Political Risk Research at BMI Research.

Today, the US remains the number one global power; however, the "rise of the rest" poses growing challenges to US leadership, said Mr. Sano. "There are a greater number of countries with greater scope of interest around the world. That being the case, it is inevitable that we'll see more clashes of interest."

Specifically, Mr. Sano told delegates that China's rise, the re-emergence of Russia and Japan, and the increasing assertiveness of mid-level powers, such as Turkey and Iran, mean their global interests will only increase, which will create greater scope for disagreement and/or conflict going forward.

In addition, Mr. Sano discussed the following topics with delegates at this year's conference:

US PRESIDENTIAL ELECTION

There is "considerable anger at the status quo candidates," which goes some way to explaining the rise in popularity of Bernie Sanders and Donald Trump. Foreign policy and security issues continue to feature prominently in the race to the White House and, regardless of who the next president is, that individual is "more likely to be assertive in terms of foreign policy than Obama."

"In terms of Trump, one of the big questions is whether he has the willingness to implement the changes he has promised to make and if he is able to do so," said Mr. Sano. Hillary Clinton, he believed she "uphold US leadership of the international order... [and] be more assertive in upholding American interests and also in intervening abroad."

BREXIT

"Ultimately, we think the UK will vote to stay in the European Union (EU)," said Mr. Sano, speaking about the June referendum on whether the UK should leave the EU. "At the moment, the polls are roughly even, but there is still 20% of people who are undecided, and we believe that a lot of the undecided voters will stick with the status quo rather than back a risky transition to an unknown period."

However, Mr. Sano went on to say that the referendum "is putting tremendous strain on both main political parties" in the UK and that it risks polarizing voters, particularly in individual countries – Scotland has already threatened a new referendum on Scottish independence if Britain decides to leave the EU.

He also warned that, even if the UK votes to remain in the EU, "a 45%-49% leave vote would be sufficiently strong to keep the Brexit momentum alive indefinitely."

CHINA

Amid China's economic slowdown, we may see more assertive foreign policy. However, Mr. Sano said that, despite recent tension in the South China Sea, he didn't believe the "powers involved want conflict, so the real danger of this is not so much conflict by design, but conflict by miscalculation."

China is also expanding into the Middle East, and is building its first foreign military base in the region in decades at Djibouti, which, "ultimately portends to a greater role for China both in the Middle East and in Africa."

The Middle East is just one element of China's proposed "one belt, one road" vision of a Eurasian road and maritime transportation corridor connecting itself with markets in Europe and the Middle East, and Mr. Sano said that "in the long term, this could be the beginning of China gradually displacing the US as the main external power in the Middle East."

IRAN-US RAPPROCHEMENT

The Iran-US rapprochement is faced with a now or never moment. The deal, which he said is considered by President Obama to be a key part of his legacy, is progressing well; however, it is still possible that it could be derailed by the inspection of Iranian nuclear facilities and its ongoing missile program, in addition to disagreements over regional conflicts where Iranian and US interests are not aligned.

GEOGRAPHIC SPOTLIGHTS

THE ISLAMIC STATE

Mr. Sano predicted the terror threat posed by Islamic State (IS) will persist for some time to come. However, he said he didn't expect a US ground invasion soon, despite US opinion polls showing that citizens increasingly favor the use of ground troops to fight against the militant organization.

"It is most likely the West's campaign against IS will consist of renewed airstrikes and possibly more special forces used on the ground," said Mr. Sano. "This will probably work to encourage divisions within IS to weaken their hold on the territory, but even if all the territory controlled by IS were to be taken over or recaptured, the likelihood is that the group would remain a potent threat. It doesn't need to control territory directly to pose international security risks."

SUCCESSION RISKS

Succession risks are becoming more urgent around the world, said Mr. Sano, citing examples in Angola, Iran, Saudi Arabia, Zimbabwe, Thailand, and elsewhere.

"In many cases, the succession issue has yet to be resolved and the danger is that the less time that the chosen successor has to be groomed for leadership, the greater the risk of a power struggle when the leader departs the scene," he said. "This could lead to major policy shifts and unpredictability in governance. In some cases, we could see highly destabilizing situations."

ENERGY

Regarding the low oil price environment, Mr. Sano, forecast a gradual rise in global oil prices, but "not to previous levels exceeding US$100." In the meantime, he foresaw lower oil prices exacerbating political risks in already troubled countries.

"For many countries around the world, low energy prices are beneficial because they mean reduced inflation, which means governments can spend less money on subsidizing fuel, transportation, and so on and central banks can keep monetary policy loose," said Mr. Sano. "However, many countries are highly exposed to low oil prices because of their dependence on oil from the point of view of export and monetary revenues."

"It seems the case that most Gulf States have sufficient reserves to weather the low oil price environment for at least the next few years," he added. "But, even so, we expect a degree of fiscal tightening to take place."

More than a third (35%) of organizations considered the possibility of Brexit to be the greatest political concern for their company*.

* Marsh survey of NOC conference delegates

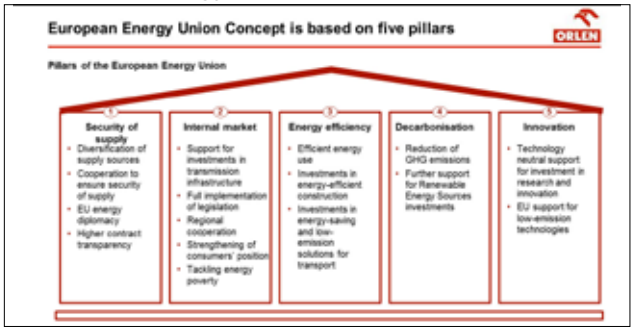
COMMON EUROPEAN ENERGY UNION COULD SOLVE EUROPEAN CHALLENGES

The European Union (EU) must form a common European Energy Union in order to address the challenges that are negatively affecting the competitiveness of the European economy, according to Dr. Adam Czyzewski, Chief Economist at PKN Orlen.

The EU currently faces a series of challenges, Dr. Czyzewski told delegates at this year's NOC, including the need to import a large amount of primary energy sources, the high cost of electricity in the EU compared with other economies, and a large dependence of the majority of Central and Eastern European countries on a single gas supplier.

Citing a recent report published by PKN Orlen, titled *European Energy Union: Compromise for Growth and Good Energy*, he said that the development of a common energy strategy would go some way to addressing these challenges and would "stimulate the development of all participating countries" at a time when they need it most.

The European Energy Union Concept is based on five pillars



Source: European Commission

However, Dr. Czyzewski worried about the will of politicians – who, he said, are "more attracted to short-term measures and actions" – to work towards a long-term policy such as a common European Energy Union, which would require considerable time and cost to implement.

Bringing countries together to form a common energy strategy would reduce the cost of energy and boost the competitive advantage of all member countries, he argued: "A single common energy system for all of Europe will be vastly cheaper to build and operate than a system of multiple national systems. In addition, it will equip Europe with the competitive edge it so badly needs right now." It would also go some way to ensuring energy security for all countries in the EU, which Dr. Czyzewski said had "become a focal issue following Russia's annexation of Crimea."

The construction of a single gas market in Europe would change all of this said Dr. Czyzewski, and would "reduce Russia's ability to use the gas supply as an economic weapon," he said. While Dr. Czyzewski conceded the creation of a common European Energy Union would not be an easy task, he said there was no time to delay. "The development of a uniform energy market, higher energy efficiency, and a low-emission economy are the goals whose implementation requires considerable investment and which will only bear fruit at a certain time... However, it should be started right way."

"Ultimately, we should strive for a single, common, and cheaper system comprising of a single common market, a single regulator, a single offsetting mechanism, and equipped with a system of mutual security guarantees in the case of extreme disruption," he concluded by saying. "This is the shared and coherent vision of the energy union."

"A single common energy system for all of Europe... will equip Europe with the competitive edge it so badly needs right now."

DR. ADAM CZYZEWSKI, CHIEF ECONOMIST, PKN ORLEN

A REDEFINITION OF THE ROLE OF OIL AND GAS IN THE NIGERIAN ECONOMY

Nigeria is witnessing a major paradigm shift that is redefining the role of oil and gas in the Nigerian economy as it moves from an export-based oil and gas industry to one that satisfies the domestic market, says Austin Avuru, CEO of Seplat Petroleum Development Company.

Nigeria is the largest oil producer and third largest gas producer in Africa, but has traditionally exported the vast majority of these products. Yet according to Mr. Avuru, the country is now "heading away from oil and gas being a primary source of income to becoming a source of energy for Nigeria."

At present, Nigeria produces 8.9bscf of gas per day; however, just 9% of this is utilized for power generation in the country, while 41% of it is exported to the international marketplace.

However, plans are in place to change all this, said Mr. Avuru "resulting in an astronomical rise in gas demand and production." Electricity production – which currently stands at around 4GW per day – is planned to increase to 40GW by 2020, which will require the domestic supply of gas reaching 12bscf per day – an increase of 10bscf per day.

The situation is remarkably similar for oil. At present, despite the country's vast reserves, 70% of the premium motor spirit (PMS) consumed domestically is imported. However, plans are under way to boost refining capacity in Nigeria from the current 445,000 barrels of oil per day to 1.2 million by 2020, potentially making Nigeria a net exporter of refined products.

These changes will have a huge impact on the Nigerian economy, said Mr. Avuru: "This will support heavy industries and the production of cement, fertilizer, and petrochems," he said, which would have "far-reaching impacts on agriculture, the domestic economy itself, and the overall contribution of oil and gas to domestic GDP."

As a result of the transformation of oil and gas from providing raw revenue earnings to economy enablers, cement production is expected to increase significantly in Nigeria, which already exports to countries across West Africa, as is fertilizer production, which is predicted to exceed domestic demand by the end of 2017. "The overall result of this is that from just sitting down and collecting rent amounting to 80% of our export earnings in Nigeria, the oil and gas industry – and this is in the short term, the next 12-15 years – will increase its contribution to GDP from its current 12%-14% to about 25%," Mr. Avuru concluded.

"[Nigeria is] headed away from oil and gas being a primary source of income to becoming a source of energy."

AUSTIN AVURU, CEO, SEPLAT PETROLEUM DEVELOPMENT COMPANY

BRIGHT FUTURE FOR PAKISTAN'S ENERGY SECTOR

Pakistan's energy sector has tremendous potential for growth as a result of recent government reforms, according to Jahangir Piracha, CEO at Engro Powergen.

"Pakistan has grappled with energy issues for the past eight to 10 years, which has affected our GDP," said Mr. Piracha. "The right types of investments were not made, primarily because the focus was on the state-owned organisations to make them. As a result, they were not done in a timely manner, so the economy has suffered." Today, however, GDP is growing at 4% per annum, and Mr. Piracha told delegates that, since the new government was formed in 2013, there had been "a new focus on bringing a lot of investment into this sector," which had brought huge benefits to the country as a whole, including the construction of new highways, railways, and dams.

In 2014, plans for a China-Pakistan economic corridor connecting Western China with nearest ports was announced, which has subsequently resulted in a US$46 billion investment, funded by state-owned Chinese banks, into port development, infrastructure, and hydro, coal, wind, and solar power plants throughout the country.

Mr. Piracha also added that security concerns in the country – which had once been a major barrier for many foreign investors – had recently improved and that the number of civilian fatalities had reduced by more than 350% since 2013. "To a large extent, the issue that was there has been tackled," he said.

The drop in the oil price has affected the implementation of the new reforms.*

* Marsh survey of NOC delegates

MEXICO'S ENERGY REFORM CREATES OPPORTUNITY FOR THE PRIVATE SECTOR

Mexico's energy reform is revolutionizing the energy industry in Mexico, bringing about huge opportunity for the participation of the private sector in activities previously only performed by the state, according to Luis Vazquez, Founder and Chairman of Grupo Diavaz.

The energy reform is one of the most ambitious and comprehensive of a series of major reforms enacted by President Enrique Pena Nieto, which "encompasses the entirety of the oil and gas industry, upstream, midstream, and downstream and sets the stage for the creation of new infrastructure," said Mr. Vazquez.

"It will revolutionize the electricity industry as well, bringing about the participation of the private sector, local and foreign, in activities previously reserved for the state. It will transform the industry to include new players, both domestic and foreign, and bring new services and equipment suppliers.

In the upstream sector, the reform has brought an end to Pemex's 75-year monopoly, and encourages participation of the private sector through contracts tendered by the new independent regulator, CNH. In the midstream sector, it has brought about the creation and efficient use of infrastructure, with an independent regulator CRE, and open access and regulated tariffs in transport, storage, and distribution activities for hydrocarbons. In the downstream sector, it has created a competitive market for fuels and other refined products.

"However, the drop in the oil price has affected the implementation of the new reforms", said Mr. Vazquez, by momentarily reducing the attractiveness of the Mexican upstream market for foreign investments. "Low prices, paired with a strict tax regime, and the risk of commencing new operations in a new, country has affected participation," he said. Nevertheless, Mexico also faces a series of midstream and downstream challenges, which Mr. Vazquez said represent "perfect opportunities for innovation in the Mexican oil and gas industry by private parties." PEMEX will soon stop being the only company that produces, imports and trades products in Mexico, and the country requires new storage and transport infrastructure for oil, gas, and refined products for the opening of new markets, as well as new refining facilities.

This is a "very exciting time," Mr. Vazquez concluded by saying; "one which will shape the future of Mexico."

"This is a very exciting time…one which will shape the future of Mexico."

LUIS VAZQUEZ, FOUNDER AND CHAIRMAN, GRUPO DIAVAZ

ROLE OF INSURANCE MORE IMPORTANT THAN EVER

The need for insurance and risk management is greater than ever, according to Dan Glaser, President and CEO of Marsh & McLennan Companies, in order to spur innovation and economic growth at a time of heightened volatility.

Citing a theory developed by the US War College to describe the post-cold war era — VUCA: volatility, uncertainty, complexity, and ambiguity – Mr. Glaser told delegates at this year's National Oil Companies (NOC) conference: "This is the world all of us and our organizations inhabit today — volatility, uncertainty, complexity, ambiguity."

"The list of emerging risks is long and getting longer — climate change, cybersecurity, water scarcity, and the sobering demographic reality of a smaller number of young people supporting a much larger number of older people," he added. "Then there's the rise of machines such as drones and 3D printing, and biotechnology, nanotechnology and artificial intelligence."

This increasing reliance on artificial intelligence is "one of the most exciting and terrifying issues of our day," he said. "I am concerned that the speed of technological advances, turbo-charged by the coming proliferation of AI devices and applications, will challenge many of our long-held principles of privacy and personal liberty in the name of national security or something far more banal: Advanced consumer marketing techniques."

Mr. Glaser said that the role of the insurance industry is essential in order to promote prosperity while intelligently identifying and addressing new and existing risks. "New risks are coming at us faster than ever before. The insurance industry has a vital role to play in risk identification as well as assisting clients in determining which risks should be avoided entirely and which ones can be appropriately managed."

"Risk is intrinsic to our quest for discovery, productivity, wealth creation, the improvement of the human condition, and virtually all other efforts that aim to produce value," said Mr. Glaser. "The core purpose of the insurance industry is to enable economic growth, the taking of risk, and innovation…The dynamic is elegant and simple: Without insurance, there is no investment, there is no innovation, and there is no growth."

In addition to its role in spurring economic growth, Mr. Glaser praised the industry's role in protecting against the downside: "Thanks to the insurance industry, lives and livelihoods get rebuilt following loss. Our people and our companies supply the products and services that enable businesses to function and innovate, communities to grow, and individuals to thrive."

Mr. Glaser also addressed the uncertainty in the current geopolitical environment, saying that we could be in for a longer period, perhaps a decade or more, of volatility.

"Moving forward, we face an unclear terrain. There are plenty of geopolitical fault lines. This political uncertainty adds to the financial and economic-related travails we have struggled with for the past seven or eight years," he said.

But despite current worries, such as the migration crisis, ISIS, and the Zika outbreak, he remarked that the world has faced periods of similarly high risks before. "It's important for us to maintain perspective, balance, and context in this new age of perpetual information, communications, and the never ending news cycle."

Climate change, he added, remains a concerning area of uncertainty. However, advances in technology could aid significantly in the challenges ahead.

"It is clear that when we put our energies into innovation — in terms of climate change as well as current and emerging risks affecting our world today — we are often able to accomplish unimaginable things," Mr. Glaser said.

"Throughout history, humans have shown remarkable capacity for ingenuity and adaptability. We have overcome challenges by applying new ideas and approaches. It is this trait that gives me optimism for the future of our planet, and our industry."

He concluded his talk by praising the industry for its role following the 2008 financial crisis in the multi-year, low-growth aftermath, which he described as being the enabler of "economic growth, the taking of risk, and innovation… [which is] integral to the flow of commerce and the regeneration of the world's productive prowess."

INSURER SIZE AND DIVERSITY BENEFIT CLIENTS IN CHALLENGING ENVIRONMENT

Marsh hosted an insurer panel discussion, which focused on the changing strategies of insurers and reinsurers as a result of the low oil price environment. The panel agreed that their relevancy to clients and ability to add value across those organizations remain key aspects to their future success.

Kamal Tabaja, Chief Underwriting Officer at Trust Re said that, while the oil price may be low at present, the long-term fundamentals present in the energy sector, mean that it is nothing other than a short-term problem. "At the end of the day, oil and gas is a long-term commodity, and for us as insurers or reinsurers, at least from an upstream perspective, we take a long-term view."

"We have a responsibility to improve the performance of the industry and to do that, we try to get as close as possible to the client to get a better understanding of what they do and how we can create solutions to the issues they face."

Meanwhile, George Stratts, President of Property and Special Risks at AIG said that partnering with the right kind of client with the right control of their risks was a key focus in today's challenging market. "It's about making sure we're partnering with the right type of clients and sharing as much as possible," said Mr. Stratts. It's about managing the total cost of risk and working together to lower that.

"We do this through engineering, through analytics, and making sure that we uncover as much as we can. So it's not just about the premium you pay, it's about the losses that are avoided, it's about the ongoing maintenance that is critical in this space," he said. "So our global portfolio, engineering insights, and lessons learned from losses are all things that are really important in this type of environment."

Michael Gosselin, Chief Underwriting Officer (Specialty) at Liberty argued that product diversity, and the ability to cross sell and leverage that capability is key in today's challenged marketplace: "I think adding value and being a relevant market is key. When we insure a client, we want to look at "cradle-to-grave" cover... I think this has worked well in places like Dubai, where Marsh maybe handles all of the lines of cover for a client. When you get to London or other major cities, it may be challenging because you have a multitude of brokers handling different lines of business.

"When it comes down to product diversification and streamlining and relevance, I think that given the current marketplace and that distribution channels are narrowing, in order to be a leader in this sector, you have to provide intellectual capital across engineering, underwriting, and claims, you have to be in the top-5 to top-10 carriers to add value and really put that message out there."

Mr. Tabaja expressed his belief in the importance of human capital in the sector and the value-add it brings to clients. "This is a specialized industry where people need more than the right price and terms and conditions; they need the corporate human capital that really understands their industry and what affects it, whether its economical, whether its driven by financial implications, etc. I think that's what people need to have a view on – where exactly are you in your corporate journey, going forward."

Also on the panel was Huw Jones, Head of Energy at XL Catlin, formed after XL's acquisition of Catlin for US$4.1 billion in 2015. M&A activity quadrupled in 2014/15, with volume increasing from US$44 billion in 2013/14 to US$195 billion, and Mr. Jones said the benefits of scale afforded by the merger translated to greater value and flexibility for clients: "What we now offer as a combined entity is a greater depth of underwriting experience, a greater product range, greater capacity, greater geographical capability, and also greater flexibility through our company as well. All of that, I think, helps us provide better and more cost-effective solutions to our clients."

INSURANCE INDUSTRY MUST INNOVATE TO MAINTAIN ITS RELEVANCY

The insurance industry must keep up with the pace of technological change in order to maintain its relevancy to clients, according to Stephen Catlin, Executive Deputy Chairman at XL Catlin.

"Assets as percentage of market capital for Fortune 500 companies were approximately 80% 25 years ago," Mr. Catlin began by telling delegates. "Today, the average is nearer 20%-25%, and the rest of the value is in intellectual property and goodwill. So our relevance to the balance sheet of our clients is almost de facto lower today than it was 25 years ago. Unless we can keep up with the pace of change, and that means we have to innovate."

Part of this, he said, involved creating new products to cover new and emerging risks, such as cyber. "There are certain risks within cyber that are the most systemic I have ever seen in my life," he said. "If you think about a manmade catastrophe or an elemental catastrophe or even a pandemic, they are by definition a regional loss. The difference with cyber is that, if someone was to find a way of closing the internet down for a day, it affects the whole world within a nanosecond."

However, he warned that, while the industry should innovate, insurers should ensure that they do so within their capabilities. "We sell our promise to pay and, if we can't honor that promise, we should never make it in the first place. This is where the challenge is. If we're dealing with cyber for an individual company or individual attack, I see no problem with that. If it involves 10 companies, OK: it's an aggregated risk, but it shouldn't be too much of a problem. But if it happens across the globe, that's a different issue."
"I reckon the economic loss that would come from that would be as much as 20 times the total market capacity of the entire global property and casualty industry," he added. "So how can we possibly make a promise to pay if there's so little capital to pay for the downside risk?"

Part of the solution to tackle cyber risk, he said, was for the insurance industry to work together with clients and governments, adding that "as an industry, we have been absolutely appalling over the years at lobbying." Mr. Catlin has agreed to co-chair the Insurance Development Forum, which aims to bring together the World Bank, UN, and government agencies and insurers on the issue.

Another area demanding innovation is in processing the insurance and reinsurance product, said Mr. Catlin, who said that the amount of time and money currently spent on it is "absolutely outrageous."

"In my 42 years in the industry, I have seen an increase in professional standards in all parts of what we do at quite a significant pace – actuary, pricing, reserving, transparency, accountability, representation, and the understanding of risk management. However, there's one thing that has hardly moved in all that time – process…We are way behind the times. If we don't sort this out ourselves, it will be done for us."

Mentioning that this was something that Google is alleged to be looking at, Mr. Catlin said the industry has to "get to a situation where data is touched once, from one end to the other, where data is shared between the policyholder, the broker, and the underwriter for all to see."

"We've got to get rid of some of this cost and we've got to be more efficient. If we don't do it, it will be done to us. And the consequences of that will be pretty uncomfortable," he concluded.

NEW MODELING TOOL LAUNCHED TO EVALUATE THE COST OF EXPLOSIONS

To assist energy firms in modeling the financial impact of explosions, Marsh launched Marsh BLAST, powered by MaxLoss™ (Marsh BLAST), at this year's conference.

Advances in understanding around the challenging science of assessing vapor cloud explosions (VCEs) has led Marsh, and its collaboration partner Baker Engineering and Risk Consultants Inc. (BakerRisk), to launch this new proprietary tool.

VCEs by their very nature are complicated events where numerous factors such as fuel reactivity, release conditions, structure congestion, structure separation and the location of ignition sources all affect their outcome. The adoption of explosion modeling techniques that take into account these many factors has remained slow within the insurance industry, while the process safety industry has modeled VCEs with these points in mind for years. "The updated methodology will provide better estimation of losses resulting from explosions and enable the prioritization of risk mitigation and risk transfer measures," said Quentin Baker, President of BakerRisk.

Explosions accounted for nearly two-thirds of the largest and costliest property damage losses incurred by the global energy industry over the past four decades, according to research by Marsh. Chris Price-Kuehne, Risk Engineering Project Manager at Marsh said energy companies can use Marsh BLAST "to calculate the maximum property damage loss across their global assets, as they undertake insurance risk assessment surveys." Marsh BLAST uses the advanced Baker Strehlow-Tang (BST) explosion model, a first in the insurance industry. The BST explosion model is a robust consequence analysis method which has been developed based upon a detailed understanding of the physics of VCEs. BakerRisk have carried out extensive research correlating the BST blast curves with flame speed, and numerous incident investigations have been taken into account to validate the BST model against real life VCE events.

The technology used in Marsh BLAST is a breakthrough for the insurance industry as it applies a bespoke implementation of the BST explosion model for EML assessment purposes. Marsh BLAST characterizes the source and release characteristics of a vapor cloud, how it builds within congested areas, and then applies the BST explosion model to estimate the ensuing damage for hundreds of possible explosions. The explosion with the worst consequence is considered to be the EML for insurance purposes. These EML assessments are carried out based upon input data collected by Mash risk engineers during their surveys of client facilities.

Upgrading the explosion model from the Congestion Assessment Method (CAM) in SLAM to the BST explosion model in Marsh BLAST provides a strong basis from which to establish the best possible estimate of risk exposure in a manner which is accepted by both the energy and the insurance industries.

"The updated methodology will provide better estimation of losses resulting from explosions."

QUENTIN BAKER, PRESIDENT, BAKERRISK

OIL: IN THEORY AND IN PRACTICE

Since its creation 43 years ago, Oil Insurance Limited (OIL) has grown from 16 members and US$160,000 of shareholder equity to 55 members and equity of US$4.4 billion, insuring now close to US$3 trillion of gross assets.

"The energy industry mutual is now the cornerstone of the risk transfer program for all its members," commented George Hutchings, Chief Operating Officer of OIL. OIL currently provides US$400 million of capacity across property damage, control of well and non-gradual pollution.

With a unique rating and premium plan, OIL provides post-loss funding designed to recoup losses from its members over a five year period.

"OIL is now a world leader in global energy insurance" said George Hutchings and is now looking to continue to grow and attract new members. The "zero sum game" pricing formula also enabled OIL to distribute some US$1.5 billion of dividends to its members since inception.

Gerard Naisse, CEO of Omnium Reinsurance Company, Total's captive based in Geneva, Switzerland then discussed "OIL in Practice." Total was one of the original founders of OIL in 1972 and to this day continues to utilize OIL as a key to the reinsurance program of its captive.

"We value the simplicity and fairness of the system" commented Gerard Naisse, highlighting the value for Total of the absence of requirement to list locations or wells. The automatic cover of new acquisitions, the fact that the limit is available for all perils (no sub-limits) and the continuity of cover created by the absence of testing and commissioning clause were cited as being particularly beneficial.

Gerard then explained how Omnium Reinsurance Company works in practice with OIL to structure its program for wholly or majority owned subsidiaries, Total's interests in affiliates and joint ventures.

Mr. Naisse highlighted how "the loss modification, in place since January 1, 2015, adds a new degree of reward for the members which have enjoyed a loss-free period; which, coupled with the recent dividends based on the whole membership results, yielded further the value for Total"

Both Mr. Hutchings and Mr. Naisse recommended to the attendees learn more about OIL benefits through the online learning platform available.

Every year Marsh publishes an "OIL Companion" which serves as an impartial and comprehensive guide for anyone considering OIL membership.

CAPTIVES

The use of captives within the energy industry is widespread, which ranks within the top-10 industries in terms of captive utilization. Petronas is a remarkable case of an energy company that has successfully set up and maintained a captive. Their captive, Energas, domiciled in Labuan, Malaysia, was first incorporated in 2005 and today achieves the following:

- Retains risk and premium in Malaysia while gaining direct access to the international commercial market.
- Exercises control over the insurance market and the insurance market cycle.
- Reduces premiums and costs, as their risk management team also controls and runs their captive. This cuts out the overheads of insurance companies.
- Allows a selective retention of risk.
- Enables unrestrictive coverage and coverage of uninsurable risks in the insurance market.
- Develops funds for other risk-transfer mechanisms.
- Shares energy underwriting knowledge with the local Malaysian insurance market.

However, the captive also faces the following challenges, which are actively managed by the Energas team:

- Stress testing for the optimum retention level.
- Continuous review and enhancement of risk and loss controls.
- Operational and administrative efficiency management of emerging risk such as cyber, political, and asset abandonment/decommissioning.

While many energy captives will share similar difficulties, some companies will face different challenges, such as the growing requirement for Sharia law captives/vehicles in the Middle East. Currently, there are 10 captives within the region. The risk-transfer mechanism principle is not permitted under Sharia law, therefore, the concept of Takaful captives has emerged as a Sharia compliant form of insurance, based on the principles of donations (instead of premiums) and profit sharing.

Within the Takaful concept there is no transfer from the participants (the insured) to the Takaful operator (the insurer). Risks are shared or pooled among participants under a mutual guarantee scheme. As a result, the Takaful operator maintains two separate and distinct accounts of funds: the Takaful participants' funds and the Takaful operator fund. The segregation is fundamental to Sharia compliance insurance operation. Although Sharia compliance is monitored by a Sharia board, there are still many debates and uncertainty over the Sharia compliance of Takaful captives. Those debates are shaping the evolution of Takaful captives in the Middle East, particularly in Dubai, Bahrain, Jordan, and Abu Dhabi.

Looking at the future of captives, the fastest growing risks written by captives will be cyber, multinational employee benefits, supply chain risk, political risk, US medical stop loss, and longevity (retirement) risk.

There are still many debates and uncertainty over the Sharia compliance of Takaful captives.

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NEW INDUSTRY-LEADING EXPLOSION MODELING SOFTWARE

Marsh BLAST powered by MaxLossTM© (Marsh BLAST) is a cutting-edge tool that models the financial impact of explosions in the energy sector.

Developed with leading engineering consultants Baker Engineering and Risk Consultants Inc. (BakerRisk), Marsh BLAST is powered by BakerRisk's MaxLossTM technology, and for the first time in the insurance industry, employs the advanced Baker-Strehlow-Tang (BST) explosion model. Energy companies will use Marsh BLAST to calculate the maximum property damage loss across their global assets, as they undertake insurance risk assessment surveys.

For more information about Marsh BLAST, please contact your local Marsh representative, or the following engineering specialist:

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MARSH & McLENNAN COMPANIES

READING ROOM

INSIGHT PAPERS PUBLISHED BY MARSH

BENCHMARKING

Marsh uses a proprietary risk-ranking system to provide an absolute measure of risk quality when compared against a defined set of criteria. From these rankings, Marsh developed its benchmarking tool to provide a proactive risk-improvement approach based on current standards and best practices, in sharp contrast to improvement plans that are based on historical performance. For many of our clients, Marsh's benchmarking reports have already proved to be a catalyst for change.

ENERGY RISK QUALITY BENCHMARKING IN THE MIDDLE EAST

This paper contextualizes risk quality in the Middle East and explores regional trends to gauge the comparative risk quality of oil, gas, and petrochemical facilities relative to more than 500 similar facilities worldwide.

BENCHMARKING THE ASIAN ENERGY INDUSTRY: STRENGTH AND OPPORTUNITY IN A RAPIDLY DEVELOPING MARKET

A benchmarking study to gauge the comparative risk quality of Asian onshore oil, gas, and petrochemical facilities relative to more than 400 similar facilities worldwide.

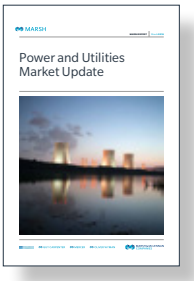
DATA-DRIVEN INSIGHTS

THE 100 LARGEST LOSSES 1974-2015: LARGE PROPERTY DAMAGE LOSSES IN THE HYDROCARBON INDUSTRY

The 24th edition of The *100 Largest Losses* reviews the 100 largest property damage losses that have occurred in the hydrocarbon processing industry since 1972. This review is based on Marsh's energy loss database, which compiles information gathered in the course of our interactions with the industry, as well as from the public domain.

CAN ENERGY FIRMS BREAK THE HISTORICAL NEXUS BETWEEN OIL PRICE FALLS AND LARGE LOSSES?

This new insights paper analyzes the historical sequential correlation between oil price falls, which led to energy firms cutting costs including safety training and education, which, in turn, led to an occurrence of significantly larger insured losses in the following period.

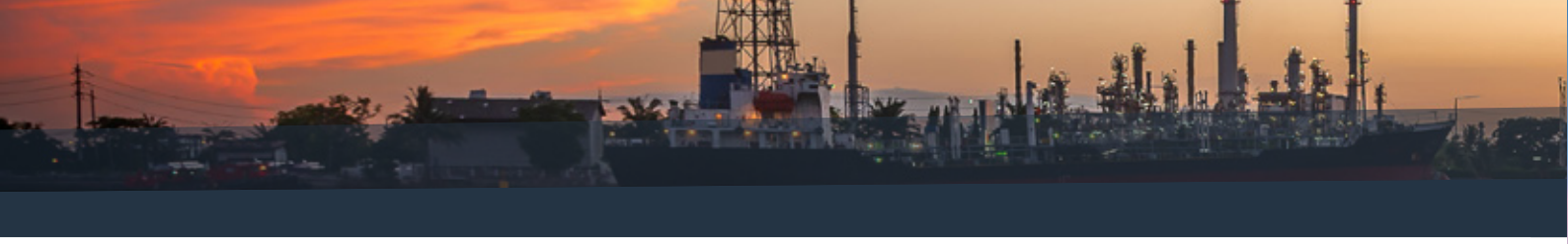


POWER MARKET UPDATE Q1 2016

The sizeable premiums associated with the power generation sector continue to attract major capital investors, according to the latest *Power Market Update*, bringing in fresh capacity to the marketplace. This new capacity needs to be flexible and competitive in order to attract business in an already oversubscribed sector.

ENERGY BRINK COMPENDIUM

This publication is a collection of oil and gas industry articles BRINK has published over the last few months. They provide critical insight into the traditional and emerging risks facing companies in the sector, as well as the opportunities available to those companies that best position themselves to take advantage of them.

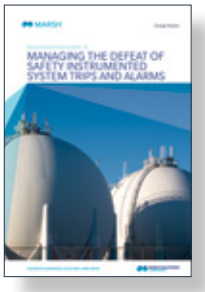


ENGINEERING POSITION PAPERS

Marsh's engineering position papers leverage our knowledge on best practices to establish standards that don't currently exist. These papers define the key attributes that we would define as being "very good."

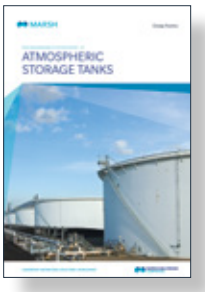
PRE-START-UP SAFETY REVIEW

These recommendations can be used to support and define risk improvements and also provide detailed advice to clients seeking to improve their management systems.



MANAGING THE DEFEAT OF SAFETY-INSTRUMENTED SYSTEM TRIPS AND ALARMS

Whenever a safety-instrumented system (SIS) is defeated, the risk exposure is increased to an extent that depends on the nature of the hazard involved.



ATMOSPHERIC STORAGE TANKS

Following numerous incidents involving atmospheric storage tanks, data has been compiled indicating that overfilling of atmospheric storage tanks occurs once in every 3,300 filling operations.

PROCESS-SAFETY PERFORMANCE INDICATORS

The process industry has a long history of major incidents that are well-publicized. The underlying causes of major incidents are often related to failures in process-safety management.

FIRE PRE-PLANS

There have been numerous large damaging fires over the years, including tank fires. These involve massive product losses and process unit fires that cause major plant damage and process interruption.

MANAGEMENT OF CHANGE

During the lifetime of an operating process plant, many changes will occur, including to the physical hardware of the plant, control systems, business processes, and/or to the organization running the plant.

MARSH

THE NOC MOBILE APP

The presentations delivered during the conference are still available via our conference mobile app. To download the app please follow the instructions below:

FOR APPLE AND ANDROID USERS:

- Search for the "Marsh NOC 2016" app from the App Store or Google Play Store.
- Open the app on your device and select the conference name.
- Be sure to allow push notifications and refresh all info when prompted to synchronize.

FOR BLACKBERRY AND OTHER MOBILE USERS:

- Access the mobile app website at: crowd.cc/marshnoc2016.

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